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Improving the Operation of Core Ovens

How a Rearrangement with Draft Fans Eliminated Faulty Baking and Increased Oven Capacity Above That of Core Room

At the plant of the Cadillac Motor Car Company in Detroit, Mich., there is a battery of nine core ovens, consisting of seven car ovens and two drawer ovens as shown in Fig. 1. Originally these ovens were fired with coke from two natural draft furnaces under the back ends of the ovens, the firing being done from a firing pit outside of the foundry building. Six of the ovens were connected to one firebox and three to another.

A great deal of trouble was experienced in operating the battery on account of the fact that the

at the right in Fig. 2. This view also shows a portion of the tin roof over the firing pit. When the wind was from the southwest, the pressure on the front of the ovens would drive the fire back so that it came out of the fire door, and hence it was practically impossible to bake cores under such conditions.

In order to overcome these difficulties two fans were installed. The first, or smaller fan, is a direct driven unit, and may be seen through the window at the left of Fig. 2. The small fan supplies air for

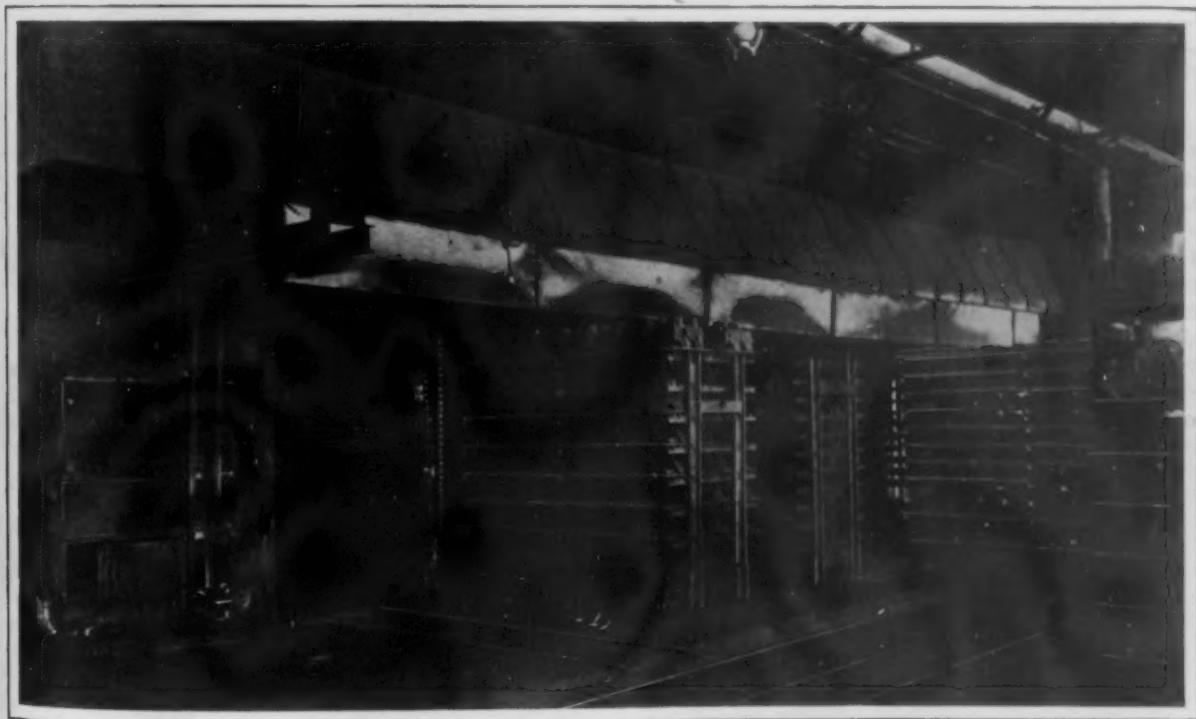


Fig. 1.—Front of Core Ovens at Cadillac Foundry

two ovens nearest the firebox were always the hottest and the end ovens the coldest. This was particularly true of the drawer oven in the set of six ovens fired from one firebox. Another trouble was that the front of the ovens was always very hot and the lower back corner cold, so that cores were burned at one end and not thoroughly dried at the other end of the ovens.

The ovens were connected with a 22-in. stack about 60 ft. high. The base of this stack is shown

the combustion of the coke. The larger fan discharges through the curved pipe in Fig. 2 and serves to exhaust the gases from the ovens. The pipe at the left which supplies the blast for the fire is arranged to create a slight pressure in the firing pit. By having the fire door closed and the ashpit door open, the pressure in the firing pit supplies the fire with forced draft and the amount of air supplied determines the amount of coke burned. This slight pressure forces the air through the flues into the

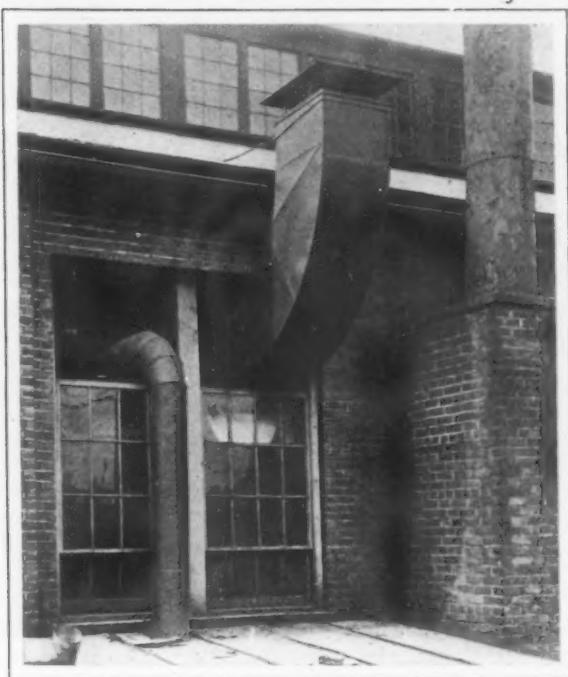


Fig. 2.—Blast and Exhaust Pipes for Forced Draft

oven so that by controlling the dampers in the flues the amount of heat admitted to each core oven can be regulated.

The exhaust fan is not used when the weather conditions are right to create a good draft in the stack, but when the weather conditions are not suitable, the exhaust fan is employed and is found to make the ovens independent of the weather. Provision has also been made for blowing in an auxiliary supply of air behind the firebox to temper the air in the flues.

At the time the above described installation was put in the ovens were equipped with pyrometers, this installation being shown in Fig. 3. There is an electric thermo-couple at the back of each oven which is connected by wires to the numbered switches shown on the switchboard. At the right there is a wall type indicator which shows the temperature in whatever oven it is coupled to at the time. The oven tender keeps a record of the temperatures, taking observations at approximately 20 min. intervals. He also records the time of placing cores in the ovens and the type of cores in each oven.

In the office some 700 ft. away there is a recording thermometer, which, by means of a suitable

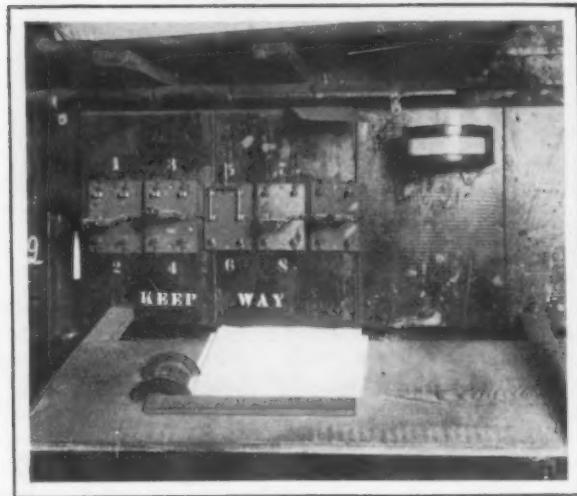


Fig. 3.—Switches and Indicator for Reading Oven Temperatures

series of switches, can be coupled to any one of the ovens, so that the superintendent can see the temperature in any oven from the office, or can have the recording instrument coupled on to any oven which he wishes to watch.

The temperature controlling installation consists of Wilson-Maeulen rods and one of the Wilson-Maeulen wall type pyrometers at the ovens and a recording instrument in the superintendent's office. The forced draft arrangements were put in by the H. M. Lane Company, Detroit, Mich., in accordance with the Lane system of oven control.

The capacity of the core room since the changes were made has never, it is stated, been sufficient to tax the capacity of the ovens, and it is believed that the ovens will bake at least 50 per cent. more cores than they would under the old arrangement. The most important point emphasized is that the cores are now uniformly baked so that there is no loss from burned or underbaked cores.

Large Testing Transformers for Japan

Two testing transformers, having a normal continuous rating of 360,000 volts and 500,000 volts for short periods, were recently built by the Westinghouse Electric & Mfg. Company, East Pitts-



Two Testing Transformers Recently Shipped to Japan. They Are Normally Rated at 360,000 Volts and Can Supply 500,000 Volts for Short Periods

burgh, Pa., and shipped to Japan. They are to be used by the Inawashiro Hydroelectric Power Company and one will be installed in the generating station on the Nippashi River at the outlet of Lake Inawashiro and the other in the receiving substation at Tokio about 145 miles away. The power company will use these transformers for testing the insulation resistance of transmission lines and the apparatus in the stations.

The transformers measure 19 ft. from the base to the top of the terminals and the tanks containing the transformers proper are cylinders 9 ft. high and 9 ft. in diameter. One high-tension terminal of each transformer is grounded to the core and case and the other is brought out as shown in the accompanying engraving. By connecting the two cases of the transformers in series, it is possible to develop a potential of 1,000,000 volts between the two high-tension terminals.

Structural Steel in Machine Design

The Possibilities of the Manufacturer's Making Use of Rolled Shapes and the Fabricator's Rounding Out His Business

BY C. A. TUPPER

In the manufacture of industrial machinery a noteworthy development is the rapidly growing use of the ordinary rolled structural shapes for frames, supports and braces, or stiffeners, to meet a great variety of service. Combinations of structural shapes can be formed to meet almost any requirement outside the range of solid castings or forgings. In fact, even these are being encroached upon, as witness the now common rolling of press machine

and to let the work out to a plant making a specialty of fabricating structural shapes is in most cases a decided economy. The latter also enables advantage to be taken, from year to year, of reductions in cost brought about by improvements in the equipment and methods of the regular structural plants; whereas the manufacturer attempting to do his own fabricating would hesitate to scrap any apparatus or increase his investment for that department for the sake of a proportional saving.

SOME POSSIBLE USES OF ROLLED STEEL

On the other hand, for simple operations on parts to be duplicated over and over, even in several different sizes, a few tools may suffice. If these can be kept in use sufficiently continuous to warrant their first cost, amortization, upkeep, operation, and share of the overhead burden, it will pay to install them. An example of this kind is the manufacture of steel foundry flasks, which are formed from strips of flat steel plates bent round, square or as hexagons and lap-riveted or welded.

A similar and equally simple use is made of angles to form rolled steel flange rings for high pressure air, steam or hydraulic systems, water jacket heads, etc. These, of course, are welded at the ends.

In considering how he can apply this idea to his own line, the manufacturer of equipment has only to look around him and draw suggestions from what others have done. For example, the writer recently saw plans for a new, light type of field tractor, the frame of which was formed entirely from standard structural shapes. A box car loader examined proved to consist largely of standard beams, channels, and plates cut to shape. The transformer frames adopted as standard by a large electrical company have been put together from channels, angles, etc., and so on. Each such case suggests others where similar methods of design can be carried out to advantage. Not only will it profit the manufacturer to seek them out but structural fabricating plants will also find it well worth while to make similar investigations on their own account, with a view to securing contract work, as fillers, from those who are likely to be interested. Mills and jobbers will, of course, profit correspondingly from the increase in material ordered.

A prize competition open to employees of members of the Society for Electrical Development is announced. The society offers these prizes, in values of \$250 to \$10, for the best story, article or report on any subject pertaining to commercial electricity. The competition closes September 1. Particulars may be obtained by addressing the competition editor of the society, 29 West Thirty-ninth street, New York City.

The G. H. Williams Company, Cleveland, Ohio, has taken a contract from the Canadian-Stewart Company, New York, for a 30-ton 8 frame boat derrick and a contract from the New York Dredging Corporation for a 3-yard heavy dredging bucket and a 30-ton 8 frame derrick.



Light Truck for Annealing Oven, Formed Entirely, Except Wheels, from Structural Channels, Bars and Braces

and printing press sections. It is not, however, necessary or desirable, as a rule, to use any other than standard shapes and sizes, such as can be bought freely in the open market. The reasons for this are obvious. They include:

1—Material can be ordered in lots as small or as large as desired.

2—Neither supply nor delivery is dependent upon the facilities of isolated plants. A stock is practically always on hand within easy shipping distance and the desired quantity can be quickly obtained.

3—The quality is uniformly the same, as mill tests keep this at a certain standard.

4—The strength of each section and the stresses which it will sustain have been definitely calculated, so that there is no necessity for the guess-work and over-allowance usual in the case of castings.

5—The work of fabricating, assembling and fitting parts is reduced to certain definitely accepted standards, which the manufacturer can take advantage of in planning his own shop efficiency.

6—Not only can the material be purchased in the open market, but contracts for its fabrication can be made on the basis of a given lot or for the season.

FARMING OUT THE FABRICATION WORK

For the average manufacturing plant to install fabricating tools of its own, or in other words, to establish what is practically a structural shop within its works, is not ordinarily the part of wisdom, unless the operations are limited and require only a few simple appliances. Tools which are needed for any great variety of fabricating or for a large volume of seasonal work could probably not be kept busy month by month throughout the year;

Results of Applied Scientific Management*

The System Which Helped to Make it Possible to Turn Out Finished Articles at Desired Times—Transporting Materials

BY GEORGE DE A. BABCOCK†

The classifying of product, another movement started at the outset, had a marked effect upon our works' effort. Previously our manufacturing orders called for miscellaneous parts or assemblies, and the assembly order contained a specification of the parts which were to be used in that assembly. Parts orders were written independently of the requisition for material. No date was specified for the part to be due in finished stores. The orders were written in quantities of 25, 50, 75 and 100, and in general it did not matter whether the part was small or large, except in the case of automatic and screw machine work or punch press work, when an order for the full quantity for the season was usually written.

THE WAY ASSEMBLIES USED TO BE MADE

These orders were not apportioned to the material ledgers, and therefore it was a case of the most persuasive foreman getting from stores the material for his parts. He could draw from stores on requisition at any time that he could find some material, and unless he had a shortage could finish his order at any time he saw fit. He had a schedule for parts to guide him. This consisted merely of a schedule of the month's production for the different types of cars, but set back as many months as our progress clerk assumed the works would need and still deliver them safely into the finished stores room in time for the issue to assemble. We had but few small sub-assemblies. The single group issues for one of our large assemblies might require as high as a quarter of the variety of parts in the finished stores.

After the assembly order was issued it was given to the finished stores keeper, who was supposed to deliver the materials to assembly against that order as rapidly as possible. When first parts of a lot were delivered to the assembly floor the assemblers started to put them together, and from that time on chasers tried to force the parts which were lacking through the shops on the remaining operations, and in and out of the finished stores room to the assembly floor. It was a merry chase.

One result of this was that operation set-ups varied from 1 to 100 pieces and on the same part might vary in this complete scale. With an average of ten operations on different drawing numbers or parts to each machine, and with the preparation time of the machines uncertain, confusion resulted by interference of orders from the different shortage chasers. Very high costs were thus created.

*Second installment of a paper, which is to be printed in these columns, substantially in full, presented to the National Metal Trades Association, Worcester, Mass., April 22.

†Production manager, H. H. Franklin Mfg. Company, manufacturer of the Franklin automobile, Syracuse, N. Y.

We produced cars, however, for a great many years under these conditions, and still believe that we represented a relatively high order of working efficiency in the automobile industry of the time. Engineering changes were frequent, the demands of the buying public were uncertain, and then it seemed to us to be the only way of solving the problem.

Now we can see how it could have been solved in a very much better way even with the full complication of a variety of models and many changes. When we began the classification of our products the

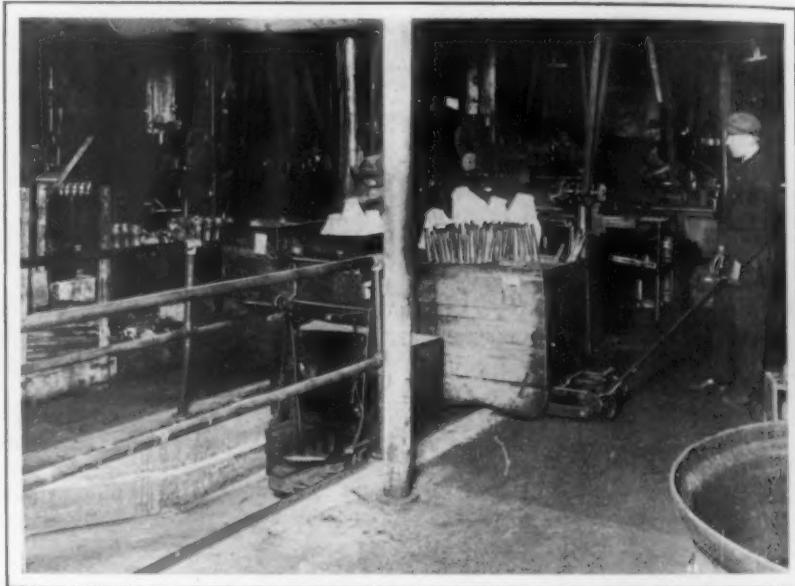


Fig. 1—The Hand Truck Has Lifted the Tote Box from the Platform of a Storage Battery Truck, Which Stands in a Pit Reached by Incline Shown at the Left.

We had but few small sub-assemblies. The single group issues for one of our large assemblies might require as high as a quarter of the variety of parts in the finished stores.

elimination of this confusion and trouble also began. Through the findings by the classification of this product, our whole scheme of control of work has come about.

SCHEME OF CLASSIFICATION OF PRODUCTS

The scheme of classification is briefly this: The first two parts made which can be fastened together as a part of the finished structure are fastened together and turned into finished stores. This unit and other parts and fastenings are issued from stores, are assembled into a larger group and then turned back into stores. This continues throughout.

In this classification we discover that in the new car, where our lot sizes have been adopted to the standard as used at present, we must make the requisition of our first piece 200 working days ahead of the time that the car can be finished. It is important, therefore, that we not only check by assembling the condition of our product, but that the lot sizes of assemblies be proportioned economically as well as lot sizes of parts.

The flow of the different parts into the sub-sections, into sections, divisions, groups, and finished product, are charted, and with detail parts entered with symbols constitute the parts analysis of our product.

On each part we determine the mechanical operations through which it must go. This is also true of the assemblies. We study the size and form of the materials to use, also whether patterns, dies or tools must be prepared, and, in fact, all that we can of the product in its last detail from the standpoint of the factory effort upon it. The time element is a very important factor in this analysis, both on account of certainty of delivery and of valuation of material and labor investment. The analysis of the product furnishes the ground work on which our control rests.

WHAT ANALYSIS OF THE PRODUCT DISCOVERED

Upon the first analysis of our product we found the cause of one of the greatest troubles that we had experienced, i. e., our inability to attain a schedule that seemed perfectly possible. Thirty-nine parts in our whole car were the cause of this, and the two longest time parts in this list were two of the cheapest things put into our car, the cylinder flange and

elevator, Fig. 2, if for the upper floors. The load is handled from the elevator much as if the elevator were a pit. The electric truck runs in with its side to the sill. The elevator is operated to raise the truck to the particular floor level on which the load is to be delivered. The load is then removed to the floor with a power hand truck, and the elevator lowers the electric truck to the ground floor and releases it. The elevator man returns at his first opportunity and delivers the load to its proper place.

In connection with the bagged materials spoken of and the adoption of a universal size for a particular part lot, the economical results of handling materials, as mentioned previously, were obtained. In addition to this, the labor of the movemen has been very much lightened, and one man can deliver a thousand pounds from stores to any place in the works with greater rapidity and ease than he could carry a pail of water over the same path. The lack of fatigue of the moveman allows a high rate of travel throughout the day. Where before movemen would ignore a pile of heavy material until they were forced to carry it, now they take whatever comes as it comes.

(To be continued.)

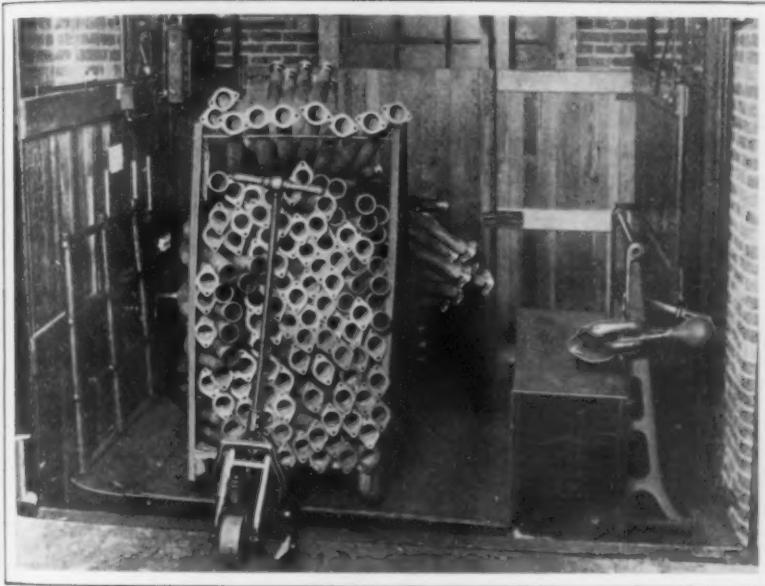


Fig. 2—For Transporting Materials Between Floors, the Elevator with the Electric Truck May be Stopped to Bring the Truck Platform Level with the Factory Floor

the exhaust valve. All of our effort on product analysis alone was well repaid by this one discovery. Standards were made for these parts and the time between the first effort on the first part and the finish of the completed car was greatly reduced.

Later discussion of the uniform schedule will show another very important result attained after this study that has to do with the investment of capital.

The illustrations accompanying the paper are exact records of our accomplishment over the periods shown. No values are shown other than by the curves for comparison, but the plottings have been arranged in such a manner that a study of the curves alone should anticipate any discussion.

AN INTERESTING DETAIL IN MOVING MATERIALS

In Fig. 1 we show the method of moving materials on ground floors. Concrete pits are sunk in the floors and properly guarded. An electric transportation truck runs into the pit to bring its platform level with the floor. The truck man lifts the material from the shop floor with a power hand truck and runs the load upon the electric truck; he then withdraws the hand truck, runs the electric out of the pit to the new destination, where it either goes into another pit on the ground floor or to an

sarily slow and of course expensive.

In seeking a better way to do the work an electric crane and magnet naturally suggested themselves, but with the rods lying loosely in the bottom of the car a hoisting magnet could not pick up a clean load. Some rods would hang and swing. To obviate this, the expedient of having the consigners wire the rods together in bundles of approximately a dozen, the size varying with the diameter, was adopted. With the rods in bundles the profitable use of an electric crane and a magnet became feasible and the apparatus was installed by the Shaw Electric Crane Company.

With the bar stock in bundles the magnet makes a clean lift, not merely of one bundle, but of bundles up to its lifting capacity. They are raised out of the car and piled practically at one operation. With the crane and magnet the company can now accomplish in a few minutes, work which under the old method took a gang of freight handlers hours to do. There is besides the saving in labor, a gain in the speed of handling raw material. The use of the crane allows also the piling of rods to a greater height than would have been economically possible by hand work.

The Toledo Boiler & Tank Company, Toledo, Ohio, has filed a bankruptcy petition in the United States court in that city. The liabilities are placed at \$35,594. An appraisement will be necessary to determine the assets.

The Bethlehem Steel Company's Tofo Mines

Extent and Character of the Chilean Iron Ore Deposits and Plans for Their Development—First Cargo Reached Philadelphia This Week

(With Supplement)

Work is going forward steadily in preparation for a large scale of operations at the Bethlehem Steel Company's Tofo iron mines in Coquimbo Province, Chile. Previous references in these columns were in an article of January 23, 1913, announcing the acquisition of the Tofo mines by the Bethlehem Steel Company; extracts in *The Iron Age* of February 13, 1913, from a paper by Charles Vattier read at the October, 1912, meeting of the Iron and Steel Institute at Leeds, England; also some account of the efforts to develop an iron industry in Chile given in Charles M. Pepper's special letter published in *The Iron Age* of January 1, 1914.

The Tofo mines are of particular interest to the iron trade of the United States because the plans on foot look toward an ultimate production of no less than 1,500,000 tons of ore a year, and also because of the long haul of the ore, the Bethlehem Steel Company's works being about 4500 miles from the mines.

At present two other notable American developments are in progress in Chile; these are the Braden copper mines and the Chuquicamata mines of the Chile Copper Company, both of which are Guggenheim enterprises. The location of all three of these interesting projects is given on the small map of Chile reproduced herewith.

TOFO IRON MINES KNOWN FOR 25 YEARS

The Bethlehem Steel Company's Tofo mines were brought to notice by Charles Vattier as early as 1888. About 1905 Mr. Vattier secured options on the whole group of mines, which were transferred by him to a French company—the Sociedad Altos Hornos de Corral—which planned to use the ores in connection with a blast furnace at Corral in southern Chile. The mines were leased from the French company by the Bethlehem Steel Company in 1912. Their location is about four miles from the coast of Chile, near the small bay of Cruz Grande. This bay is located near the Bay of Totorallillo, which was once quite important, on account of a copper smelter being located there. The smelter depended for its ores upon La Higuera. This was formerly an important copper mining district about four miles southeast of the Bethlehem Steel Company's Tofo property. Some of the La Higuera mines are still active.

The Tofo iron deposit is found on the tops of two hills, which are separated by a slight depression or saddle. The general features are shown in Fig. 1 of the accompanying views, this one being taken from the land side in the direction of La Higuera. The approximate lower limit of the solid ore is shown by a dotted line, everything above this line being solid iron ore of high quality. The analyses from over two hundred samples taken from above this line have averaged as follows:

Iron	68.00	per cent.
Manganese	0.20	per cent.
Sulphur	0.015	per cent.
Phosphorus	0.057	per cent.
Silica	1.50	per cent.

This is a higher grade ore than any mined in the United States at present; it is also of higher

grade than the famous Swedish ore which has been shipped into the United States at the rate of nearly half a million tons a year for the past four or five years. If such ore now exists in the United States in any quantity it is probably in some of the California and Utah deposits, which are very similar geologically and chemically to the Tofo ores.

TWO ORE BODIES

At the time of the first examination of the property by the Bethlehem Steel Company's engineers in 1912 practically no prospecting had been done, and there was some doubt as to the actual occurrence, there being nothing to prove absolutely that it was not a superficial "skin" of ore over a rock core. Reasoning from other occurrences, it was considered safe to assume a certain depth, somewhat proportional to the superficial extent, which could be closely determined, as there is no vegetation. Subsequent exploration has shown that this assumption is well founded, and that there is considerably more ore than was computed at the time of the first examination.

In a general way there are two ore bodies very nearly connected in the saddle between the two hills. The deposit in the South hill has a diameter of about 1000 ft., or roughly an area of 18 acres. The top of this hill is 785 m. above sea level, and at present ore is known to occur at an elevation of 620 m., so that the known vertical height of ore is 165 m. or 550 ft.

The deposit in the North hill is somewhat similar, and has not shown as great a vertical height of ore, but with the loose or float ore, with which it is surrounded, it will contain at least one-half as much ore as the South hill.

The general character of the deposit is shown in the various views in the accompanying Supplement. A large amount of the float ore, which is especially abundant on the east side of the deposit, is shown in Fig. 2. It can be seen that instead of a mine the Bethlehem Steel Company's Tofo property is essentially an iron ore quarry. Conditions are ideal for cheap open-cut mining, and the ore, though hard and dense, will be quarried by steam shovels after it is broken up by blasting. There is no overburden, and it will be many years before the deposit is worked sufficiently low to make it necessary to remove any of the adjacent rock.

AERIAL CONVEYOR SYSTEM

The height of the main deposit being about 2300 ft. above sea level, it is natural that the French company should have constructed an aerial cableway to convey to the coast the limited amount of ore which was necessary for supplying its furnaces at Corral. In the fall of 1912 the company reconstructed this tramway to give a nominal capacity of 800 tons per day, and also reconstructed a cantilever loading bridge at the bay. The stockpile and loading bridge are shown in accompanying views. A number of cargoes have been loaded from this bridge, and it is found to work satisfactorily, except that the loading is rather slow for American practice. An improvement in the way of substituting a rubber belt, instead of the buckets now used, will soon be made



1—Tofo Hills from the Southeast. Practically everything above the dotted line is solid iron ore
2—South Hill from the North. All above dotted line, also left foreground, is solid iron ore
3—View of the ore, top of South Hill, showing jointing in the ore and typical vegetation
4—Corral or stable at Tofo, built entirely of float iron ore which will average 65 per cent iron

VIEWS OF THE BETHLEHEM STEEL COMPANY'S IRON MINES IN THE TOFO DISTRICT, CHILE

S. DIESCHER & SONS.
Mechanical and Civil Engineers,
PITTSBURGH, PA.



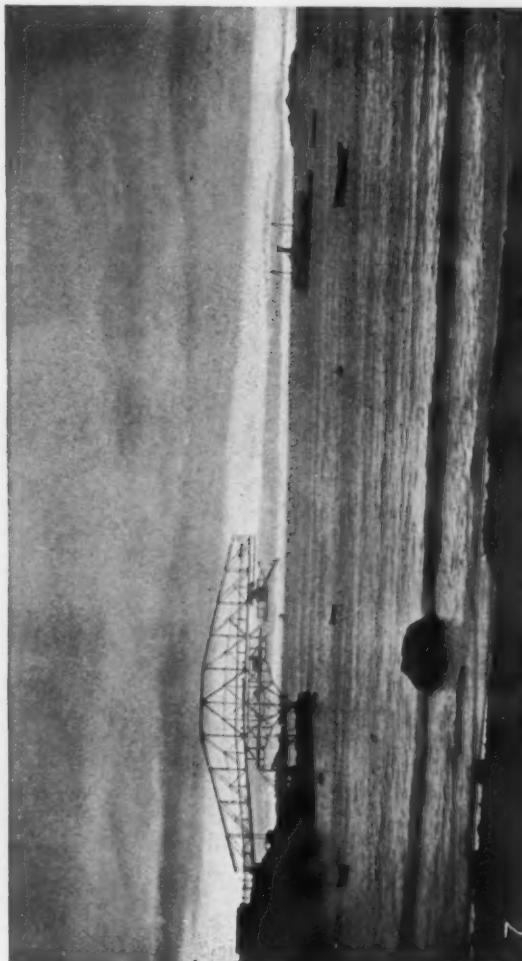
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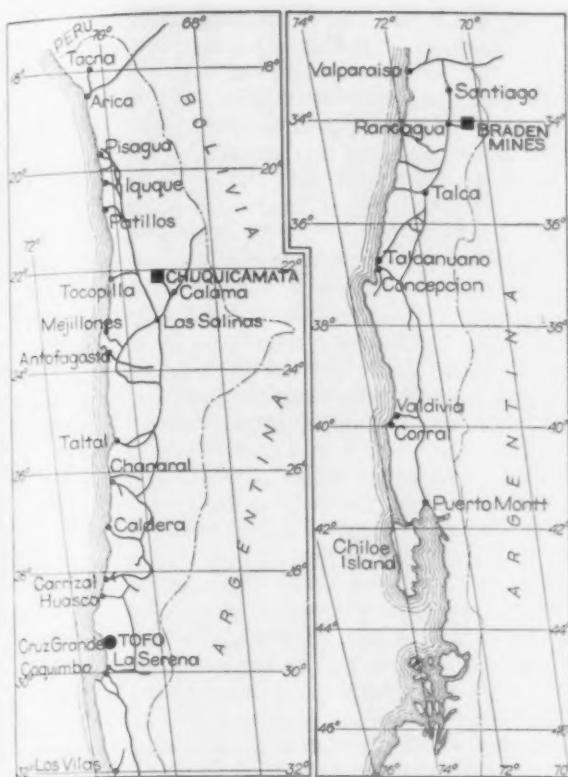


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5—Laborers' village built near South Hill in Spring of 1913
7—Present ore bridge at Cruz Grande Bay. Picture taken on an exceptionally cloudy day

6—La Higuera, 4 miles from Tofo, formerly an important copper mining center
8—Cruz Grande Bay, showing the ore bridge and ore stock pile at the transway terminal

IEWS IN THE TOFO MINING DISTRICT, CHILE, AND AT THE LOADING POINT IN CRUZ GRANDE BAY



Map of a Part of Chile. Right hand portion is continuation to the south of map on left

by the Bethlehem Steel Company, and in the meantime the construction of a steel dock, of the type in use on Lake Superior, will be undertaken, as already announced, the contract having been taken by the United States Steel Products Company. An electric railroad will also be built which will haul the crushed ore from Tofo to Cruz Grande.

GEOLOGY OF THE TOFO DEPOSIT

Geologically the Tofo deposit has no parallel in the eastern United States or in the Lake Superior region. It does not exist in lenticular pods in gneissoid rocks, as in the case of the New Jersey and New York magnetites, nor as the regular bedded ores of Alabama; nor yet as concentrations from a sedimentary "iron formation" as in the Lake Superior region. As far as present data goes, it seems to be a "contact" type of deposit, similar to many of those in the western part of the United States. The deposit in Iron Springs, Utah, has many points of similarity to Tofo.

At Tofo the ore-bearing rock is an andesite, which after its intrusion deposited the ore it had contained "in solution" while the rock was in a molten state. Upon cooling, the ore, mainly in the form of magnetite, was isolated instead of remaining disseminated, thus forming simply a ferruginous rock. This isolation was apparently caused by the other components of the molten magma being to a certain extent used up in forming new associations with the "contact rocks."

The Tofo ore seems to be a mixture of magnetite and hematite. Some samples are intensely hard and dense, and exceedingly magnetic, while a nearby sample may be typical hematite, with entire absence of magnetism. The chemical differences chiefly are concerned with the phosphorus content, and in this respect conditions are very good. Thus there are three grades of ore:

Non-Bessemer, with phosphorus content above 0.068 per cent.

Bessemer, with phosphorus content between 0.020 and 0.068 per cent.

Low phosphorus, with phosphorus below 0.020 per cent.

Fortunately these grades occur separately and can be mined separately without the least difficulty. The tonnage of each grade is about the same, there being approximately about one-third of each. The commercial importance of the separation of grades will be thoroughly appreciated by miners and sellers of iron ore.

SEVEN CARGOES A YEAR PER VESSEL

In order to provide for the transportation of the Tofo ore, long-term freighting contracts have been entered into with Swedish and Norwegian owners, which provide for the construction of a fleet of 17,000-ton d.w. steamers, especially designed for the ore trade by the Bethlehem Steel Corporation's naval architects. These vessels will be approximately 520 ft. in length, 65 ft. beam, and capable of transporting approximately 15,000 tons of ore, being designed along lines which will be particularly adapted for prompt loading and discharging.

To insure a regular supply of Chilean ore at the furnaces at South Bethlehem, these vessels will return to Chile in ballast, and for this purpose extra large water ballast compartments have been provided to insure the necessary buoyancy. It is calculated that by returning to loading port in ballast each steamer will be able to deliver seven cargoes per year, or, say, one hundred thousand tons.

By the time the first of these large ore steamers is ready to load at Cruz Grande, which it is expected will be some time the early part of 1917, work will have been completed on the steel hopper dock referred to above. It will be capable of loading 15,000 tons of ore per day, with a storage capacity of from 30,000 to 35,000 tons, or two full cargoes.

FIRST CARGO REACHES PHILADELPHIA

Prior to the completion of the new steel hopper pier, the ore, as at present, will be loaded into steamers under the cantilever bridge, which is capable of loading at the rate of 2000 tons per day. After the substitution of rubber belt conveyors for

Table Showing Weather Observations Taken at Cruz Grande, Chile, Month of January, 1914

Day of Mo.	WEATHER CONDITIONS			TEMPERATURE, FAHR.			WIND DIRECTION AND VELOCITY, MI. PER HOUR			CONDITION OF CRUZ GRANDE BAY		
	7 A.M.	12 M.	5 P.M.	7 A.M.	12 M.	5 P.M.	7 A.M.	12 M.	5 P.M.	7 A.M.	12 M.	5 P.M.
1	C.	C.	CL.	63	76	—	S.W. 0	S.W. 4	4	N.	N.	N.
2	C.	C.	CL.	65	72	65	1 S.E. 9 S.E. 3	N.	N.	N.	N.	N.
3	C.	C.	CL.	65	76	68	1 S.E. 10 S.W. 3	N.	N.	N.	N.	N.
4*	CL.	68	—	—	—	—	S.W.	—	—	—	—	—
5	C.	CL.	CL.	63	68	74	S.E. 5	S.E. 12 S.W. 4	N.	N.	N.	N.
6	C.	CL.	CL.	65	68	65	S.E. 2	S.E. 12 S.W. 3	N.	N.	N.	N.
7	C.	CL.	CL.	65	72	68	1 S.E. 3 S.W. 2	N.	N.	N.	N.	N.
8	C.	CL.	CL.	66	76	77	S.E. 4 S.W. 1	N.	N.	N.	N.	N.
9	CL.	CL.	CL.	66	77	81	S.E. 4 S.W. 0	Ch.	Ch.	Ch.	Ch.	Ch.
10	CL.	Pt. C.	66	72	70	80	S.E. 5	S.E. 8	S.W.	R.	R.	R.
11	CL.	—	—	77	—	—	S.E. 4	S.W.	—	—	—	—
12	C.	CL.	CL.	67	74	77	S.E. 4	S.E. 8 S.W. 3	N.	N.	N.	N.
13	C.	CL.	CL.	65	74	77	S.E. 4	S.E. 6 S.W. 2	N.	N.	N.	N.
14	CL.	CL.	CL.	67	72	81	S.E. 5	S.E. 8 S.W. 2	N.	N.	N.	N.
15	C.	CL.	CL.	67	71	76	S.E. 4	S.E. 10 S.W. 1	N.	N.	N.	N.
16	C.	CL.	CL.	66	72	77	S.E. 4	S.E. 3 S.W. 1	N.	N.	N.	N.
17	CL.	CL.	C.	65	65	72	S.E. 4	S.W. 6 N.E.	N.	N.	N.	N.
18	—	—	—	—	—	—	N.E.	—	—	—	—	—
19*	CL.	CL.	C.	68	72	70	N.E. 3	S.W. 13 S.W. 2	N.	N.	N.	N.
20	C.	C.	CL.	68	68	68	W.	1 S.W. 10 S.W. 2	N.	N.	N.	N.
21	C.	C.	CL.	68	76	76	W.	5 S.W. 7	Ca.	Ca.	Ca.	Ca.
22	C.	CL.	CL.	68	76	67	W.	6 S.E. 2	Ca.	Ca.	Ca.	Ca.
23	C.	C.	C.	66	71	67	S.E. 4	S.E. 6 S.W.	N.	N.	N.	N.
24	C.	C.	C.	65	77	70	N.W. 1	W.	N.	N.	N.	N.
25	—	—	—	77	—	—	—	—	—	—	—	—
26	CL.	CL.	C.	66	76	70	W.	5 W. 2 W. 1	N.	N.	N.	N.
27	C.	C.	CL.	68	72	79	S. 1	S.W. 10 S.W. 4	N.	N.	N.	N.
28	Pt. C.	CL.	CL.	68	72	74	S.W. 2	S.W. 12 S.W. 2	N.	N.	N.	N.
29	CL.	CL.	C.	68	74	74	N.W. 2	S.W. 14 S.W. 3	N.	N.	N.	N.
30	CL.	CL.	CL.	67	71	76	S.W. 6	S.W. 8 S.W. 3	N.	N.	N.	N.
31	C.	CL.	CL.	66	71	74	N.W. 5	S.E. 20 S.W.	N.	N.	N.	N.

NOTE: The wind velocity is the average velocity in miles per hour for the time to succeeding observation.

C—cloudy CL—clear. N.—normal. R.—rough. Ca.—calm. Ch.—choppy.

*Earthquake tremor early morning. †Earthquake tremor 1:30 P.M.

the buckets now used, it is expected that a 6000-ton steamer will be loaded in 12 hours.

To provide for the transportation of this ore prior to the time of completion of the new steel pier and the fleet of large ore carriers, the Bethlehem Company has entered into freighting contracts with European owners for the carriage of approximately 750,000 tons in the next two years, to be delivered in the United States.

Prior to the opening of the Panama Canal, and which, according to all indications, will be in the latter part of this year, all ore shipped from the Tofo mines will, of course, proceed via the Magellan Straits. The steamer Epsom, the first to deliver Chilean ore in the United States, arrived at Philadelphia Sunday, June 7, after having completed a voyage of approximately 8600 miles. It cleared from Cruz Grande on April 22 and was thus 46 days on the way.

CLIMATIC CONDITIONS

One who writes from full knowledge of the climatic and other conditions in the Tofo district says:

"The climate and general features of this part of Chile are very generally misunderstood by Americans. Nine out of ten persist in calling Chile a tropical country, also an unhealthy country. It is not generally known that Chile has as many climates as the United States, but it is to be remembered that the north and south extent of Chile is from 18 deg. south latitude to 56 deg. south, or over 2500 miles. Thus, if the southern end of Chile were placed over the southern end of Florida, the northern end would reach as far north as Southampton Island on the north side of Hudson Bay, in the latitude of Iceland. Therefore, one can readily see how difficult it is to answer the question, 'What is the climate of Chile?' When one considers that the climate also depends on altitude, irrespective of latitude, and that Chile has elevations varying from sea level to 18,000 ft., it can easily be seen that he needs a definitely stated location to give any opinion of value on the climate.

"In the immediate vicinity of Tofo weather conditions are ideal, except that rains are few and far between. Tofo is located just between the arid belt, which reaches from Coquimbo to Peru, and the semi-arid belt, extending from Coquimbo a considerable distance southward. A rain at Tofo is of rare occurrence, but fogs are frequent, and help to supply the moisture that supports a very scanty vegetation of cactus and scrub brush. In the valleys irrigation produces excellent results, and at Serena cultivation is very extensive, and most excellent fruits and grains of all kinds are produced."

There is appended a weather record for the month of January, 1914, which shows the character of the climate at Cruz Grande. At Tofo mines temperatures would range five degrees to ten degrees lower, due to the 2000 ft. altitude. As January is one of the summer months, it will be seen that no one would suffer from excessive heat when the temperature ranges from 60 deg. to 80 deg. Fahr. The temperatures do not differ greatly from the above in the winter months, a freezing temperature at Tofo being extremely rare.

PEOPLE AND GOVERNMENT

The authority quoted above says of the Chilean people and government:

"As much misinformation regarding the people and general conditions in Chile seems to exist among Americans as exists regarding climate. There are many Americans who believe there is a considerable negro element all along the west coast. This is true in Colombia and Peru, but it is not at

all true in Chile. The entire population in Chile is either Spanish or Indian, or a mixture of the two, with a very noticeable number of English and Germans who have long resided in Chile and are true Chileans. Immigration from southern Europe has never taken place to any extent, and immigration from Spain has generally failed, because of the greater opportunities offered in Argentine.

"Another common error is to confuse the stability of the government in Chile with that of the countries in the northern part of South America. As a matter of fact, Chile and Argentine have enjoyed a stability of government entirely unknown by any other American republic except our own. The last revolution in Chile occurred in 1884, thirty years ago, and to-day life and property rights are as secure in Chile as in any country in the world. People will be found in the United States who dilate on the dangers to life in Chile from violence, but in the opinion of the writer life there is safer than in our large American cities.

"Agriculturally southern Chile is far advanced and the productions go far to make the country self-contained as far as foodstuffs are concerned. The most delicious native canned fruits and vegetables are cheap and plentiful. There are wholesale grocery houses in Coquimbo and La Serena that carry stocks entirely comparable in variety and excellence with those of any wholesale house in American cities of 50,000 inhabitants. Valparaiso is one of the greatest outfitting points in South America, and anything from a toothpick to a steam roller can be purchased there."

Molybdenum and Corrosion of Steel

In a paper presented before the Iron and Steel Institute at its London meeting, May 7 and 8, J. Newton Friend and C. W. Marshall gave details of experiments to determine the influence of molybdenum upon the corrodibility of steel. The steels were all tool-turned and cut into cylinders 1.4 cm. in diameter and 4.0 cm. in height and weighed approximately 40 grams each. The results are summarized as follows:

1. Molybdenum up to 4 per cent. does not appear to exert any marked influence on the corrodibility of steel when exposed to tap water, salt solution and dilute sulphuric acid (0.05 per cent.).

2. The results of exposure to 0.5 per cent. sulphuric acid are almost identical with the mean corrosion factors obtained by the exposure of the steels to the other corroding factors, tap water, salt water, dilute sulphuric acid and alternate wet and dry tests. This is interesting because it so frequently happens that the solubility of steels in the stronger solutions of sulphuric acid gives entirely unique results, which are quite untrustworthy guides as to the behavior of the metal towards neutral corroding agencies.

3. The greatest variation in the corrosive factors is exhibited in the wet and dry tests, the resistance of the steels greatly increasing with the percentage of carbon. The molybdenum, on the other hand, tends to increase the corrosion very markedly. It is difficult to say what conclusions are to be arrived at from this, but if, as the writers believe, the wet and dry tests correspond most closely to the conditions under which steel ordinarily corrodes in practice, it is clear that, from the corrosion point of view, molybdenum is an undesirable constituent of steel if present to a greater extent than 1 per cent.

The autumn meeting of the Iron and Steel Institute will be held in Paris, September 17 to 19. The sessions will be in the hall of the Comité des Forges. Visits will be made to places of interest in Paris and vicinity, including the works of the Compagnie des Moulins. After the meeting a visit will be made to Nancy, and Monday and Tuesday, September 21 and 22, will be spent at the principal iron mines and metallurgical works of French Lorraine.

ELECTRIC ROLLING MILLS*

A Brief Statement of Advantages of the Electric Drive in Steel Mills

BY WILFRED SYKES†

In this country we have, altogether, 160 installations of electric motor main roll drives, totaling 250,000 h.p. constant rating. In Germany, where they produce only one-half as much steel as in this country, they have 700 electric installations totaling 900,000 h.p., which would indicate that the Germans have analyzed conditions more carefully, and are more solid in their convictions that the electric drive is the proper thing or they are more extravagant in the use of their money. However, the fact is that with half the production the Germans have four times the electric mill drives installed in this country.

An important item to be considered in any industrial plant is the financial condition of the company. In a great many cases, operating economy is not always of primary importance. When the remodeling of an old plant is taken in hand it is evident that it is of very little importance whether you save 50 per cent. of the power bill or 60 per cent., so long as the capital outlay required for this saving is kept down. Usually the first cost is emphasized, as comparatively few industrial concerns have such a supply of money that the initial outlay can be disregarded as long as the use is justified by the results accomplished. Usually it is a case of doing the most you can with a certain amount of money. After the money has been spent the problem is to show the results.

We do not build machines appreciably more efficient than we did 15 or 20 years ago, but we do build them cheaper and in certain respects having better characteristics. However, except in special cases, they do not give better results than the old machines. An important exception is, of course, the mill and crane motor.

GOOD ACCOUNTS OF MOTORS IN OPERATION

A daily inspection of a steam plant is not customary, whereas, with electrical installations they are continually inspected to insure continuity of service. Recently in looking over the records of an electrically driven sheet mill, the small amounts of time lost due to the equipment was surprising, and probably did not amount to more than one-fifth of similar mills steam driven. When it is considered that approximately 40 men were working on the mill the loss, due to delays, can be readily appreciated, yet, in making comparisons between electric and steam drives such figures are usually neglected. One reason for this is that it is almost impossible to obtain reliable data on such points, and usually the man installing a new plant cannot form a mental picture of the difference between the two systems, as they are usually acquainted with only one side of the case. If it were possible to collect such data from mills in actual operation, the large monetary loss, due to delays, could be capitalized.

The maintenance of electrical machines is necessarily low. The parts that wear out or are most liable to damage have a small unit cost, and if the amount of repairs were large it would mean that the machines were out of operation so long that it would not be considered practical. This is not the case with steam engines, due to their larger number

of working and wearing parts, and consequently after a machine is a few years old the constant renewal of parts is necessary. Maintenance is a growing charge with steam plants, due to the great number of wearing parts. This is not the case with electric drives.

With steam engines the steam consumption is influenced by the skillfulness of the operator, which is not the case with electric motors. With steam engines in steel mills we have to depend upon the estimate of steam distribution, which very often widely differs from the facts. A few of our plants have investigated their steam distribution and probably can make some accurate estimates, but in the majority of cases it is nothing more than a guess. The use of steam meters helps to clear up this point, but unfortunately their natural characteristics are such that with light loads they are not particularly accurate, consequently there may be quite a large amount of steam flowing during a day when the mill is idle, passing through leaky valves, which the steam meter gives very little indication of.

In spite of the investigations that have been carried out in various plants and allowing for condensation, it is almost invariably found that quite a considerable amount of steam cannot be accounted for. This is sometimes as high as 20 per cent. and is undoubtedly due to leakages and condensation not allowed for.

BRIEF OF THE DISCUSSION

H. C. Siebert, steam engineer, Carnegie Steel Company, Duquesne, Pa.: The proportion of work done in one case by a twin tandem reversing engine working non-condensing on a blooming mill was as follows: 55 per cent. i.h.p. available at rolls, 18 per cent. used in acceleration and 27 per cent. used in friction; steam consumption, 48 lb. per h.p. hr. Another engine of the same type: 62.5 per cent. useful, 15 per cent. acceleration and 22.5 per cent. friction; another, 47 per cent. useful, 35 per cent. acceleration and 18 per cent. friction. Another simple engine 20 years old: 75 per cent useful, 16 per cent. acceleration and 18 per cent. friction.

Mr. Lock, general manager, Apollo Steel Company: We use about 200 kw. hr. per ton of sheets produced. This includes power for lights and auxiliaries. About the best that a steam driven plant can do is 900 lb. of coal per ton of sheets produced. At least this is the best I have seen to date. Where the electric driven mill is superior to the steam driven mill is in the uniform speed at which the mill is driven. There is practically no variation in the speed of the motor. I do not know of a steam driven mill that does not experience trouble from this source. We have a 1400-h.p. motor driving six mills and the average peak is 1050 to 1100 h.p.

R. A. McGregor, power sales manager, Henry L. Doherty Company: I can cite one instance where it is claimed that a plant was turning out sheets at \$1.15 per ton cost of power and their yearly output was 50,000 tons of sheet and the coal bill was \$58,000, so you see the coal bill alone was \$1.16 per ton.

Brent Wiley, engineer, Westinghouse Electric & Mfg. Company: I think the total power cost, with coal at \$1.50 per ton, will be represented by considering the coal cost as 40 to 45 per cent., and if coal is taken at \$2 a ton the coal cost will represent from 50 to 55 per cent. of the total power cost.

E. H. Haslem, manager, McIntosh Hemphill Company, Pittsburgh: Mr. Locke is getting nothing from his motors that he could not get from steam engines; he is simply comparing new motors to old engines. I can only suggest that conditions

*From an address made before the Association of Iron and Steel Electrical Engineers, Pittsburgh, May 2.

†Westinghouse Electric & Mfg. Company, Pittsburgh.

be alike before comparisons are made between motors and engines. I am sure steam engines will roll just as good sheets as motors. There are cases where the motor drive is the best, and in such cases where I am called in consultation I unhesitatingly recommend motors, but there is still a big field for steam engines.

Charles Fitzgerald, Jr., assistant steam engineer, Carnegie Steel Company: If an engine is properly designed it will not stall any more likely than a motor. The same thing applies to slowing down. The amount of steam can be cut down just as well as the current for the electric motor. Steam can be measured just as well and nearly as correctly as the electric current. It is my opinion that central station power will not appeal to any one with blast furnace gas to burn.

Mr. Sykes: To take up the question of fly wheel capacity. The electric man, for his own protection has made a great many more investigations than the steam man, and the motor flywheel is usually more nearly the right size than is the steam engine flywheel.

Lake Iron Ore Shipments in May

The amount of iron ore brought down the Lakes from the Lake Superior region in May amounted to 3,852,063 tons as compared with 7,284,212 tons in May, 1913. The table below gives the May and season shipments by ports and the corresponding figures for 1913, all in gross tons:

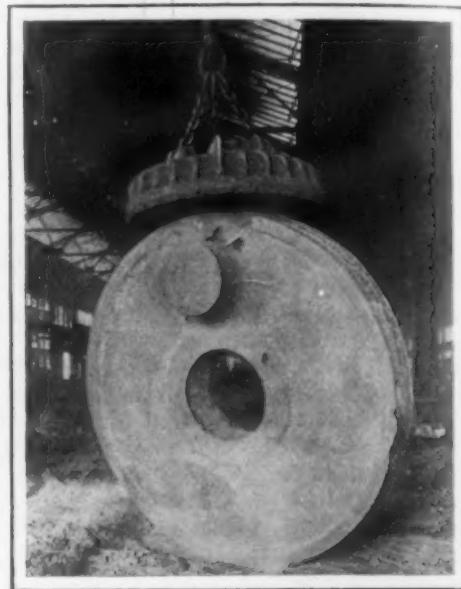
	May, 1913	May, 1914	To June 1, 1913	To June 1, 1914
Escanaba . . .	738,158	385,188	955,187	495,917
Marquette . . .	489,547	121,873	527,041	121,873
Ashland . . .	681,460	300,928	734,941	341,766
Superior . . .	2,047,396	1,673,269	2,300,271	1,735,607
Duluth . . .	1,939,848	734,090	2,100,220	734,090
Two Harbors	1,387,803	636,715	1,532,939	692,496
Total . . .	7,284,212	3,852,063	8,150,599	4,121,749
1914 decrease . . .		3,432,149		4,028,850

The decrease of 3,432,149 tons for May, 1914, is a strong contrast to the increase of 1,365,136 tons for May, 1913. The Duluth percentage to June 1 was 17.81 this year against 25.77 last year, while the Great Northern dock at Superior shipped 40.57 per cent. of the total, against 27.52 to June 1, 1913.

THE MAGNET IN THE FOUNDRY

Shaking Out Large Castings by Means of the Lifting Magnet

The Ohio Steel Foundry Company, Lima, Ohio, is making a rather interesting use of a 63-in. lifting magnet. It is used for shaking castings out of the flasks and also for handling the hot castings from the shake out heap to the cleaning department.



A 30,000-Lb. Crank Disk Ready to Be Lifted

In one of the illustrations the magnet is handling a vanadium steel locomotive frame weighing 9300 lb. These frames are among the heaviest ever made and 28 were supplied to the Lima Locomotive Corporation for use on the 14 locomotives which are being built for the Delaware, Lackawanna & Western Railroad. In the other illustration, the magnet



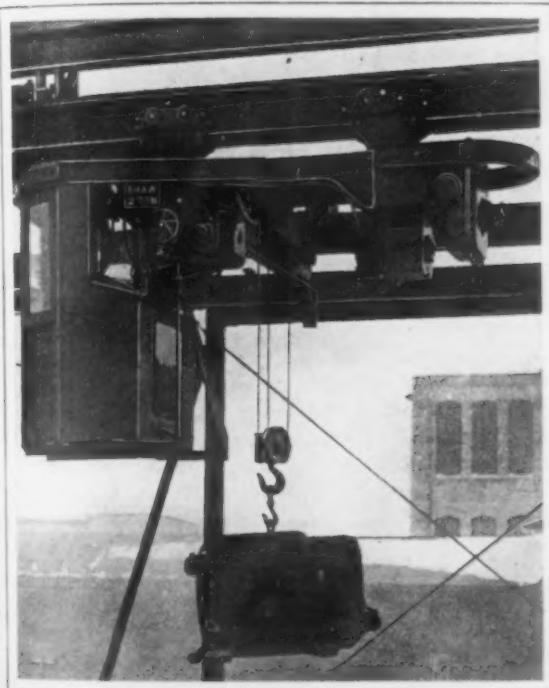
A Vanadium Steel Locomotive Frame Casting Weighing 9300 Lb. Being Handled by a 63-In. Lifting Magnet

is handling a crank disk, weighing 30,000 lb. These disks were furnished the Hooven, Owens, Rentschler Company for use in connection with the five 6000-hp. combination steam and gas engines which are being built for the power plant of the Ford Motor Car Company. These engines, the first of which was illustrated in *The Iron Age*, October 9, 1913, are believed to be the most powerful internal combustion engines in the world and have four double-acting 42 x 72 in. cylinders set two in tandem on each side.

The crane employed for handling the magnet is a special one, which was built by the Toledo Bridge & Crane Company and is equipped for handling a 1½ cu. yd. grab bucket as well as a lifting magnet.

An Improved Electrical Monorail System

A recent development of the Shaw Electric Crane Company, 119 West Fortieth street, New York City, is a fixed-tongue track switch for use with the overhead monorail system, employed in



A Typical Two-Motor Monorail Hoist

intra-factory transportation. The main advantage of the switch is that it does not have to be set for the desired direction of travel and consequently there is neither delay nor expenditure of effort for this purpose. The operator in the cab selects his route and the trolleys run through the track switches in all directions without stopping. In the very nature of the switch there are no open ends of the track to be protected, so that it is impossible for the trolley to break through and fall to the ground.

The switch has two slots through which one truck side passes, one when the trucks run through the main switch and the other when the trolley is diverted to the spur track. In either case it is emphasized that the truck wheels run over the gaps, but the wheelbase of the truck is so proportioned with reference to the slots that three wheels always ride on the runway flanges and the wheels bridge the gaps at such an angle that the break is only nominal.

The way in which the leading truck is steered to the spur track is shown in the accompanying

drawing which is plan view of a right-hand switch. When the operator reaches the switch and desires to run off on the spur track, the horizontal roller T_1 , located in the front portion of the leading track, is raised by the steering lever in the cage and engages

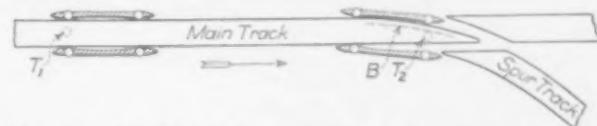


Diagram of a Fixed Tongue Monorail Switch and Trolley Showing Construction and Position of Trucks

the curved flange B on the underside of the central tongue of the switch. In this way the leading truck is swiveled and diverted on to the spur track and it is pointed out that no steering operation is necessary to return from the spur to the main track nor to run through the track switch in either direction on the main line. To prevent the trolley from splitting the switch the trailing truck is made to follow through the leading one by the use of an adjustable set screw in the side of the rear truck. This screw limits the angle that can be made between the center lines of the front and rear trucks to that of the angle of the switch and as the leading truck proceeds around the curve, the angle between the two parts increases until it reaches the maximum value when the frame casting slewed the rear truck around and compels it to follow the front one along the spur track.

A Large Special Cast-Iron Pulley

The Dodge Mfg. Company, Mishawaka, Ind., has recently made a special cast-iron taper pulley for the American Tire Company, Saugus, Mass. This pulley is made up of 20 separate machine molded pulleys and the different sections will not be fastened together, but will be kept in place on the shaft by set screws. The sections of the pulley were molded from regular patterns with the rims lagged to allow for turning the taper face, each section being machined separately. The diameter of the pulley is 34 1/16 in. at the large end and 10 in. smaller at the other end. The face width of the pulley is 120 in.



A Large Special Cast-Iron Taper Pulley 120 In. Wide Which Is Made Up of 20 Separate Parts

The American Emery Wheel Works, Providence, R. I., has recently increased its machine shop department by the addition of a 16-in. x 12-ft. Lodge & Shipley engine lathe, an 18 and 36-in. x 8-ft. Fay & Scott extension gap engine lathe and a No. 9 S Standard Machinery power press. For the manufacturing department specifications are now out for a 1000-ton hydraulic press, complete with compressor. Work will soon be started on a third floor addition, 55 x 100 ft., to the East River street building, to be used as main offices. The present ground floor offices will be converted into additional manufacturing space, made necessary by constantly increasing business.

The C. Reiss Coal Company, Sheboygan, Wis., states that the report that it would build a power house at Waukegan, Ill., is not correct. An item based on this report was printed in *The Iron Age* of May 28.

Late Developments in By-Product Coke Ovens*

New Features in Waste Heat and Regenerative Types—The Question of Capacity—Coke from High Volatile Coals

WILLIAM H. BLAUVELT†

At the meeting of the Institute in New York a year ago the status of the by-product oven in America was most ably presented and the interest with which that paper was received encourages me to bring to your attention some of the latest developments in this industry, which is becoming of such importance to the iron and steel manufacturer. In 1913 the tonnage of by-product coke amounted to 12,714,700 tons, or over 27 per cent. of the total coke produced in the country. This is an increase of about 1,600,000 tons over 1912, and it is probably safe to prophesy that by the close of the current year the production will be at the rate of 14,000,000 tons. Compared with 1910, this means a growth of 100 per cent. for four years.

CONSERVING OUR NATIONAL RESOURCES

From the United States Geological Survey reports it appears that the average value of the coke and by-products obtained per by-product oven in 1912 was \$11,265, as compared with \$1,019 as the average yield per bee-hive oven. The total value of the by-products recovered was over \$16,000,000. If

in some by-product ovens is showing conclusively that the high volatile coals of the Connellsburg and Klondike districts make by-product coke quite equal to the best coke that can be made in bee-hive ovens from the same coals.

The distribution of the 42 by-product coke plants in the United States is such that in almost every case they are located at the point of consumption rather than at the coal mines, as distinguished from the almost universal practice with regard to bee-hive plants. In the five coke-producing states of the South the percentage of by-product coke is much larger than in the country as a whole. With the completion of present construction nearly half of the coke made in the South will be by-product coke. This point is worthy of consideration in connection with the work the Southern States are doing in the conservation of their resources.

One of the most notable improvements which has been made in the industry since its introduction into this country is the increase in output per oven unit and per man employed. When the first ovens were brought over from Europe they had a capacity

of 4.4 tons of coal per day, and one crew of men was capable of handling about 25 ovens. This gave a capacity of 110 tons of coal per day with a unit crew. To-day the most modern ovens have a capacity of 20 tons of coal per day, and improved organization and modern machinery permit practically the same crew to handle from 50 to 60 of these ovens, thereby coking from 1000 to 1200 tons, instead of the original 110 ovens. I know of none of the other metallurgical industries which has shown the same growth in tonnage efficiency in the same time. This is a conservation

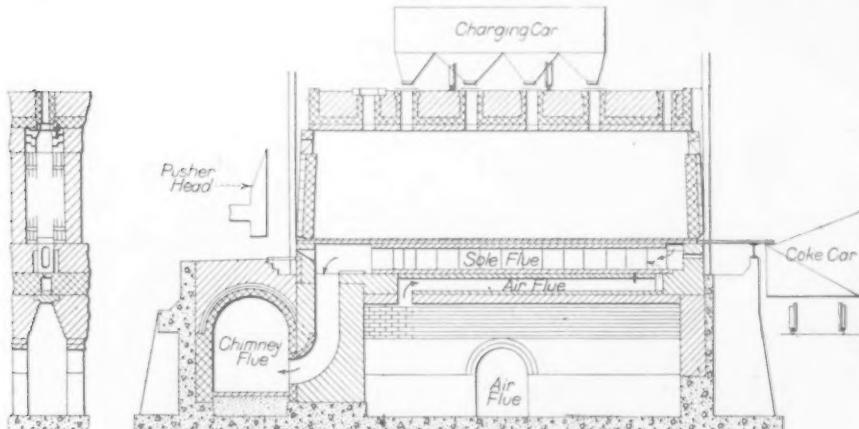


Fig. 1—Simple Form of Waste Heat Oven

the by-products had been recovered from the coal used in making coke in bee-hive ovens, they would have been worth approximately \$80,000,000—at the prices ruling in that year. The average yield of coke from by-product ovens was 75.3 per cent. and in bee-hive ovens 64.7 per cent., a difference in favor of retort ovens of 10.6 points, or 16.4 per cent. If this difference had been added to the production of bee-hive coke it would have added to the wealth of the country 5,390,000 tons of coke if the same coals had been cooked in by-product ovens, in addition to the above value of the by-products. This loss is equivalent to the absolute destruction of about 6,800,000 tons of our coal supply during the year. I have given these figures as suggestive of the importance of the by-product oven in the conservation of our natural resources. In this connection it is interesting to note that recent work

of labor well worth consideration along with the conservation of our coal supply. Progress in this respect has been distinctly greater in America than in Europe.

WASTE HEAT OVENS

The by-product oven has been developed along two lines: the waste heat oven, and the oven recovering the maximum amount of surplus gas. The former is the simpler type. It is ordinarily installed in places where the gas has little value. With the growing use of machinery for the storage and preparation of coal and for the preparation of coke, and the substitution of machinery for hand labor in other parts of the process, the requirements for power have grown materially, so that the amount of power required for a modern coke oven plant is very considerable. There are many cases where the most economic results are obtained by a plant so designed that there is just enough heat in the waste gases to supply the steam required for the operation of the plant, leaving the remainder

*A paper, substantially in full, presented at the sixth general meeting of the American Iron and Steel Institute, New York, May 22.

†Consulting engineer, Semet-Solvay Company, Syracuse, N. Y.

of the gas available for sale to nearby consumers.

A boiler plant properly designed for waste heat, with its accompanying economizers for preheating the feed water, is the most economical apparatus

special brick used to build up the recuperator. It is manifest that there are many cases where this type of oven, with its low cost of construction and simplicity of operation, has important advantages.

REGENERATIVE OVENS

In plants where there is a demand for all of the available surplus gas at a good price, it is, of course, desirable that the oven should be designed to use the smallest amount of gas for fuel, even though the chimney losses are greater, and the cost of producing steam for the plant is increased. It is clear that there is a dividing line which must determine the selection of the best type of oven for any given installation, and that all the factors entering into the undertaking must be given due weight before

either kind of oven is finally adopted.

Fig. 3 shows an oven designed to operate with the smallest amount of fuel, and at the same time maintain, as far as possible, simplicity of construction and operation. In this design regenerators are substituted for the recuperative system, one pair of regenerators for each oven, with the two chimney flues arranged between them. The whole construction of the oven and regenerator is located between the two vertical walls peculiar to this type of oven. These walls extend from the concrete foundation straight through to the top of the oven. The operation of the regenerators is, in general, similar to that of an open-hearth furnace, except that an entire block of 60 or more ovens is reversed at one operation, as will be described later. The air is usually blown in by a fan located beyond the reversing damper and is distributed under the block through one chimney flue. It enters at the bottom of the regenerator, rises and passes through the flue

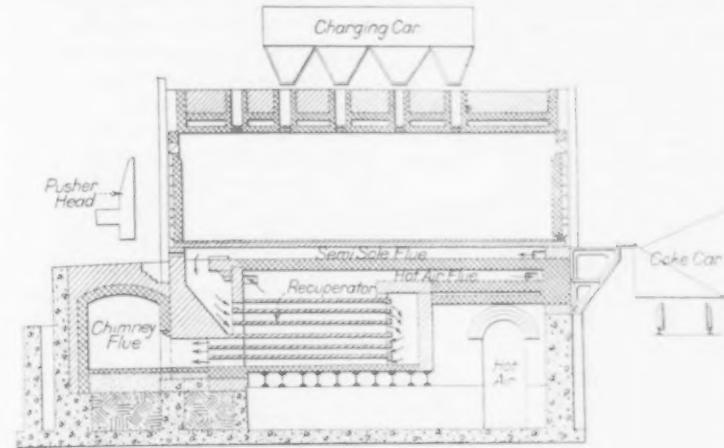


Fig. 2—Waste Heat Type of Oven with Recuperator

for utilizing heat in an industrial plant; that is, such a boiler plant will deliver the gases to the chimney, or to the exhaust fan which often replaces the chimney, at the lowest possible temperature consistent with commercial results. Such a design permits a very simple type of oven, with low first cost and low cost of operation. In the type of oven with which I am most familiar, the Semet-Solvay oven, these principles have been thoroughly developed, and under the conditions described above very satisfactory results have been obtained. Fig. 1 shows the arrangement adopted in the construction of this oven.

The gases are burned in the combustion flues shown, and then passed to the sole flue beneath the oven and out through the chimney flue to the boiler plant. The air for combustion passes first under the sole flue and then through the narrow flues on each side, where it comes into intimate contact with the heated brickwork; thence upward to the heating flues, where it meets the gas. By a proper proportioning of these parts enough heat is abstracted by the air from the waste gases so that the highest temperatures may be produced in the combustion flues, and at the same time sufficient heat remains in the waste gases to produce all the steam required for the operation of the plant, without any expense for fuel or for labor in firing. By this system something over 40 per cent. of the gas is available as surplus. This system requires no attention from the operators except the regulation of the air at the burners on the one hand, and the maintenance of proper water supply to the boilers on the other. This method of heating the air is called "recuperation" to distinguish it from the familiar form of regenerator common to most high temperature furnaces.

In Fig. 2 a more efficient form of recuperator is shown, modeled somewhat after the recuperative glass furnaces, for example, which are successfully used in Europe. In this oven the hot gases pass through the recuperator flues, making two passes on their way to the chimney flue, and the air rises through the small vertical flues arranged in the

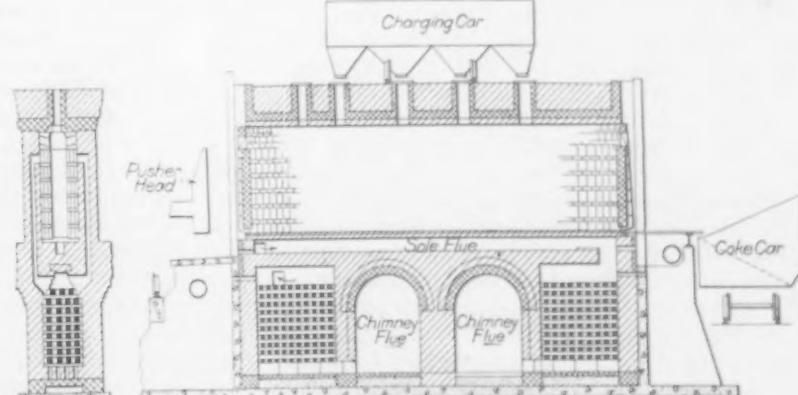


Fig. 3—Surplus Gas Type of Oven with Regenerators

system, meeting the gas at the several burners in the combustion flues. On reversal, the air enters the other regenerator, rises through the air flue, shown in dotted lines, and descends through the horizontal combustion flues, meeting the gas as before. The products of combustion pass out through the other regenerator to the reversing damper and stack in the usual manner. By this system the entire series of combustion flues are swept by all of the air required for combustion, so that hot spots are prevented and a very uniform temperature is maintained throughout.

PROBLEMS IN OVEN HEATING

Any one familiar with the use of the high temperatures required in metallurgical work will realize the difficulties connected with the proper heating of a by-product oven. The walls of the chamber are, say, 36 ft. long and about 12 ft. high. Every portion of both of these chamber walls must be heated to a high temperature, and the temperature must be uniform in all parts, excepting that perhaps the upper part may be somewhat cooler. Any inability to control the temperature at any portion

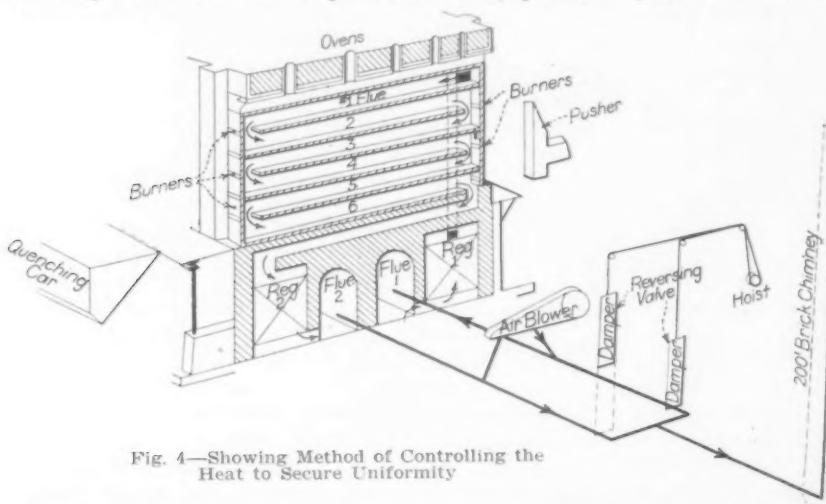


Fig. 4—Showing Method of Controlling the Heat to Secure Uniformity

of this surface, about 430 sq. ft. means the production of imperfect coke, delay in the operation, or injury to the brick work. The method used in controlling the heat over this surface is shown in Fig. 4, in diagrammatic form. The air raised by the regenerators to a temperature of about 1000 to 1100 deg. C. travels through the flue system, as above described. At the ends of the flues are shown gas burners, consisting of simple pipes, which admit the gas as shown. When the air is traveling downward through the system it flows through the first flue until it reaches the first gas burner shown at the right. The stream of gas is deflected downward by the air current and burns in the air as it travels through the flue. At the end of the second flue the air meets another stream of gas, which also is deflected downward and heats the third flue, and so on, until the gas from the last burner consumes the last of the oxygen.

When the air current is traveling upward the streams of gas are deflected upward, so that the entire combustion system is reversed at the usual half-hour periods by the manipulation of only one reversing damper for the entire block of ovens. A proper adjustment of the relative amount of gas delivered by each of the burner pipes maintains just the right relation between the heats in the different parts of the system, with the minimum attention. This method insures the most even distribution of heats throughout the whole heating system. It seems clear also that in the practice of passing the entire volume of air required for the combustion through the entire flue system there is a gain in efficiency of transfer of heat from the hot gases to the oven walls, as compared with the older methods of heating.

THEORY OF OVEN HEATING

There has been some discussion as to whether the heating of a by-product oven is effected by radiant heat or by convection and conduction, but I believe that the arguments are distinctly in favor of the latter theory. Under the conditions which exist in a coke oven the brick wall, at working temperatures, is a good conductor of heat. This is il-

lustrated by the fact that an increase of the thickness of this wall from $2\frac{1}{2}$ to $4\frac{1}{2}$ in. does not demand in practice a higher temperature in the flues to produce the same result in the coking chamber. The flame as burned in the oven flues is only slightly luminous, and it has been shown by good authority that the radiation from a non-luminous flame is only about one-third of that from a luminous flame. Moreover, since radiant heat is transferred in accordance with the difference between the fourth powers of the temperatures of the radiant and receiving bodies, while heat is transferred by conduction proportionately to the first power of the difference in temperatures, it would seem clear that under the conditions we are considering, at least a large portion of the heat transferred from the hot gases to the flue walls must be by convection and conduction, and the system which uses this latter method is the more efficient.

In a system of heating flues where the layers of gases lying next to the walls are practically stationary or moving slowly, it has been shown by experiment that these layers of quiet gases form an effective non-conductor which offers a greater obstacle to transfer of heat than the degree of conductivity of the wall itself. When the flow of gases is sufficiently rapid to sweep away these quiet layers the hot gases are permitted to come in direct contact with the walls and transfer their heat to the substance of the wall according to the first power of the difference in temperatures, and the efficiency of the transfer is proportionately good. The comparative rapidity of flow of the gases during their combustion also has the practical value of distributing the heat and preventing injury to the brickwork, avoiding thereby the dangerous condition which arises in an operation where temperatures are generated approaching the melting point of the refractory material.

Turning to the diagram it will be seen that each burner is directly under the hand of the man in charge of the heats as he walks in front of the ovens, and each flue may be inspected at a glance, by the removal of a plug from a peep-hole. The importance of convenient access both to the control of the gas supply and to the inspection of the heating flues in a block of by-product ovens cannot be stated too strongly. With a given coal, the quality of the coke produced depends very much upon the maintenance of the proper temperature in the oven, not only as a whole, but in every part, since nothing injures the quality of the coke more effectively than inequalities in the heat in different parts of the chamber, so that certain portions of the charge are over-coked while the cooler spots are being finished. In an industrial plant it is essential that any important operation shall be done conveniently and in comfort to the operator, otherwise one may be sure that it will be done badly except under the closest supervision. Given good construction and simplicity of parts, the oven which permits the most convenient and accurate control of the heats is the best oven.

A written discussion was submitted by Carl A. Meissner, chairman of the Coke Committee, United States Steel Corporation, which is given nearly in full as follows:

Discussion of the Paper

The figures given in Mr. Blauvelt's very interesting paper show in a striking manner to how great an extent our national coal resources, and the valuable by-products derived therefrom, could be conserved by the more extensive use of the by-product as against the bee-hive coke oven in the manufacture of coke. He shows clearly how much has still to be done in this country in order to replace the bee-hive ovens by the by-product ovens. The main reason for this is claimed to be the high initial cost of constructing a by-product oven plant as against a bee-hive oven plant. I say "claimed to be," because when we consider all the costs—the conservation of the coal, larger coke yields, the recovery of the gas, tar, sulphate of ammonia, benzol, etc., in fact, all factors connected with the question of manufacturing coke from coal—it is not possible to present any figures that will not show a much larger return on the original investment from a by-product coke oven installation as against a bee-hive coke oven installation for coking the coal taken from a given area of coal lands. This is the ultimate crux of the whole situation from a manufacturer's standpoint.

The advantages of better coking control, more uniform quality of coke, ability to collect and mix at one plant various coals, to improve blast-furnace operations, also lessen the coke consumption and reduce the whole cost of making pig iron as well as improve its quality for making steel are all points that have to be taken into consideration.

PROBLEM OF INCREASE IN CAPACITY

Mr. Blauvelt refers to the gradual increase in capacity of ovens, which is governed largely by their dimensions and by the coking time. I am satisfied that we will be able to increase this capacity slightly with every new plant that we may build until the final limits, which will be governed by practice and experience, are reached. Great care must be exercised in doing this. I know of several cases where attempts were made to "jump" to greater dimensions with very unsatisfactory results.

As to the number of ovens to a battery and the number of batteries to a plant, this is again a matter for careful study and consideration, and I would like to ask Mr. Blauvelt what he considers from his experience to be the limit in such units from the operative standpoint. We have at Gary, Ind., 560 ovens and at Joliet, Ill., 280 ovens, and our experience has been that the operating cost per ton of coke at these two plants is practically the same. We feel that it would not be wise to place more than up to 100 ovens of American silica brick construction in a battery nor install more than 600 ovens in a plant unit. The operative supervision becomes more difficult unless additional department heads are employed, which means increased cost, and where coke has to be "made right" in order to give the best results in a blast furnace, this operative supervision is a factor of prime importance.

COKING HIGH VOLATILE COALS

The most important question that has probably delayed more serious consideration of by-product coke oven installations and prevented greater progress in this direction, has been the one of whether high volatile coals can be coked in by-product ovens so as to give as good a blast-furnace coke as many of them do in bee-hive ovens. This refers particularly to the great Connellsville and Klondike coal regions, though it also affects many other districts having high volatile coals heretofore not considered

fit for coking even in bee-hive ovens. Mr. Blauvelt refers to his successful experience with the use of such coals and all of our experience in this direction shows that many of these high volatile coals can be coked to the extent of 100 per cent., so as to give a good blast-furnace coke, while in other cases suitable coke is made by the admixture of 10 to 35 per cent. of low volatile coals. Even those coals which have been considered by many as not being at present available for coking purposes—such as certain sections of the Pittsburgh seam, and those of a great many other coal districts—have been and are being used to make a satisfactory blast-furnace coke by being mixed with larger quantities of low volatile coals, up to 60 and 80 per cent. of the latter being used.

There can be no further question in my mind that the present types of by-product coke ovens have solved the problem of ultimately being able to utilize for coking purposes in a greater or less degree almost any bituminous coal found in this country. Even anthracite coals are mixed in small proportions with some of the high volatile coals in Germany and have been found to make a more satisfactory coke than some of these high volatile coals when coked at 100 per cent. All this it is utterly impossible to carry out in the wasteful bee-hive oven.

In view of all the above, the point of keen interest is the type or system of by-product oven which is best suited for accomplishing this. Mr. Blauvelt very clearly points out what the requirements of the horizontal type of oven are for this purpose, and he shows that simplicity and perfection of uniform heating are the two main requisites.

The new Semet-Solvay horizontal flue regenerative oven described by him is the latest type of by-product oven constructed to meet the conditions in this country. It naturally differs materially from the latest type of vertical flue oven now in successful operation in the United States. It represents the successive and progressive steps made by the Semet-Solvay Company in strength, simplicity and effort for uniform temperature.

REGENERATION AND RECUPERATION

Much has been said in favor of simplicity of recuperation as against regeneration for the combustion of the gas in the flues, also of continuous heating versus reversing; but all told, all modern types have finally found it to be more economical and efficient to use regeneration in place of recuperation, except in certain isolated cases, as pointed out by Mr. Blauvelt. Unless great care is taken in design, it is almost impossible to prevent short-circuiting or leakage of gas and air in recuperative chambers or flues and this is not only wasteful, but impairs to a certain extent the efficiency and the control of combustion.

The strength of construction in this latest type of Semet-Solvay oven is a noteworthy feature of great importance, for strength of oven and flue walls is imperative in our modern coke-oven practice of fast driving necessitated by short coking time. The simplicity of control of gas and air and the ready supervision of the combustion in the flues by means of peep-holes are factors that will appeal to all coke oven operators.

As to coking time, I regret we have no definite data from Mr. Blauvelt, for this is a point of great importance to us. We have found as a rule that the shorter coking time gives the best blast-furnace coke and that there must be no delay in pushing the coke out of the oven after it is coked. What the actual length of coking time for various coals alone or in mixture is, has to be determined by actual

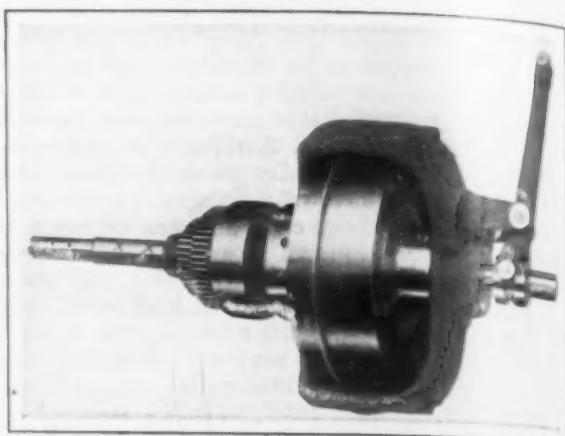
trial; so far we find that there is no great difference in coking time in the type of oven with which I am most familiar, whether we use high or low volatile coals. It may be found advisable to increase the coking time somewhat when using all high volatile coals, but the difference between this and low volatile mixtures does not in our present experience exceed about two hours on the average.

In view of its ability to obtain high and uniform coking temperatures, I can see no reason why the new Semet-Solvay coke oven should not be able to make coke in practically the same time as that of any other system. All in all, this latest development is of keen interest to us as it is the purpose of the company with which I am connected, the United States Steel Corporation, to adopt always the latest and most approved type of by-product coke oven, being in no sense whatever tied down to any one system by preference, prejudice or any other reason.

A Mechanical Lathe Reversing Device

An improved form of mechanical reversing mechanism has been developed by the International Machine Tool Company, Indianapolis, Ind., for its heavy duty turret lathe which was illustrated in *The Iron Age*, April 27, 1911. The object of this device is to eliminate the necessity of employing a reversing countershaft or reversible motor, where frequent tapping operations, etc., are to be performed.

The reversing mechanism is a self-contained unit that can be applied to a lathe in place of the standard driving pulley as is shown in the illustrations. Its position on the machine and the control from the operator's regular position by a shifter bar are also shown. This device is designed to give satisfactory service under the severe conditions of usual operation and for that reason the construction has been made strong, compact and durable. The gears are engaged by band frictions.



A Reversing Mechanism for Lathes Designed to Take the Place of a Reversing Countershaft or a Reversible Pulley

7½ in. in diameter which are controlled from the front of the machine where all the other controls are concentrated. All of the gears used are of steel with bronze bushed bearings on hardened studs and complete lubricating facilities.

The Electric Iron and Steel Industry

"Electric Furnaces for Making Iron and Steel" is the title of Bulletin 67 recently issued by the Bureau of Mines. The authors are Dorsey A. Lyon and Robert M. Keeney. This Bulletin, which contains 142 pages, gives a historical review of electric furnaces for making iron and steel. Part I is devoted to pig-iron manufacture and Part II to the electric furnace in the manufacture of steel. In regard to the former it is stated that the electric furnace was not developed as a competitor of the blast furnace but for the purpose of finding a furnace and a process that would be able to produce iron in those localities in which blast-furnace practice was not feasible or where the increasing cost of suitable fuel was becoming prohibitive to the existing practice of smelting in blast furnaces. Referring to steel manufacture, the Bulletin states that in 1904 only four electric steel furnaces were used in Europe for making steel, whereas today there are 114 such furnaces producing steel in Europe and the United States and 30 others in the course of erection. According to the authors there are only 14 electric furnaces in this country. Of the 114 furnaces in operation in all countries, 84 are arc and 30 are induction. Of the 30 under construction 26 are arc and 4 are induction. Problems which remain to be solved in the use of electric furnaces are discussed. The various types of pig-iron and steel furnaces are described and discussed and valuable data on costs are given. An interesting feature is an account of the installation at some of the important plants and of the processes.



The Mechanism in Place on a Lathe Showing Method of Control from Operating Position

B. K. Morton & Co., steel manufacturers, Sheffield, England, who have established a high reputation in Australasia, the Far East and Canada, are now turning their attention to the American market with a view of establishing agencies in the various industrial centers. They call special attention to their Rayo Extra high-speed steel and non-tempering steels, but also make other carbon steels of high standard. Their products are fully described in a catalogue prepared for the benefit of steel users.

The National Sanitary Company, Massillon, Ohio, recently incorporated with a capital stock of \$500,000, to take over the plant formerly owned by the National Sanitary Mfg. Company in Salem, Ohio, has completed its organization by the election of F. H., Jacob S., Charles T., Frank H. and Floyd Snyder, Louis P. Mauger, Richard Johnson, Simon M. Wefer and George H. McCall as directors. The officers elected are: F. H. Snyder, president; Jacob S. Snyder, vice-president, and Richard Johnson, secretary and treasurer.

Progress at Panama-Pacific Exposition



THE accompanying photographs show the condition of a portion of the Panama-Pacific Exposition at the present time. The building shown at the top is the Palace of Varied Industries, the view shown being that of the south facade. This building is 541 ft. long and 414 ft. wide. The outside walls are 65 ft. in height and the transverse naves are 110 ft. high. The main dome is 160 ft. in height and 100 ft. in diameter. The central portion of the structure, which is the one shown, is regarded as one of the most beautiful. The cost of construction of the whole building, exclusive of the ornamentation, was \$312,691. The vestibule of the main entrance to the Palace of Machinery is shown in the central picture. This picture was taken from the most northerly of the three



arched portals constituting the main western entrance to the Palace. The friezes at the base of the columns were illustrated in *The Iron Age*, March 26, 1914. The figures are 7 ft. high and the columns are 4 ft. in diameter.

The engraving at the bottom of the page is a view looking south along the Avenue of Progress, which is one of the main thoroughfares between the exhibition buildings, toward the Fillmore street hill. At the right of the picture are the eastern facades of the Palaces of Varied Industries and of Mines and Metallurgy, and on the left is the Palace of Machinery, which is the largest wooden building in the world. The picture also shows the effect of the star tipped flag staffs of Douglas fir. They are painted Spanish red, and the stars are gilded.



Atlanta Steel Company's Billet Mill

Weight of Ingots 50 Per Cent. Greater
and Billet Output Is Increased—New
Gas Plant and Heating Furnaces



Fig. 1—Morgan Continuous Billet Mill

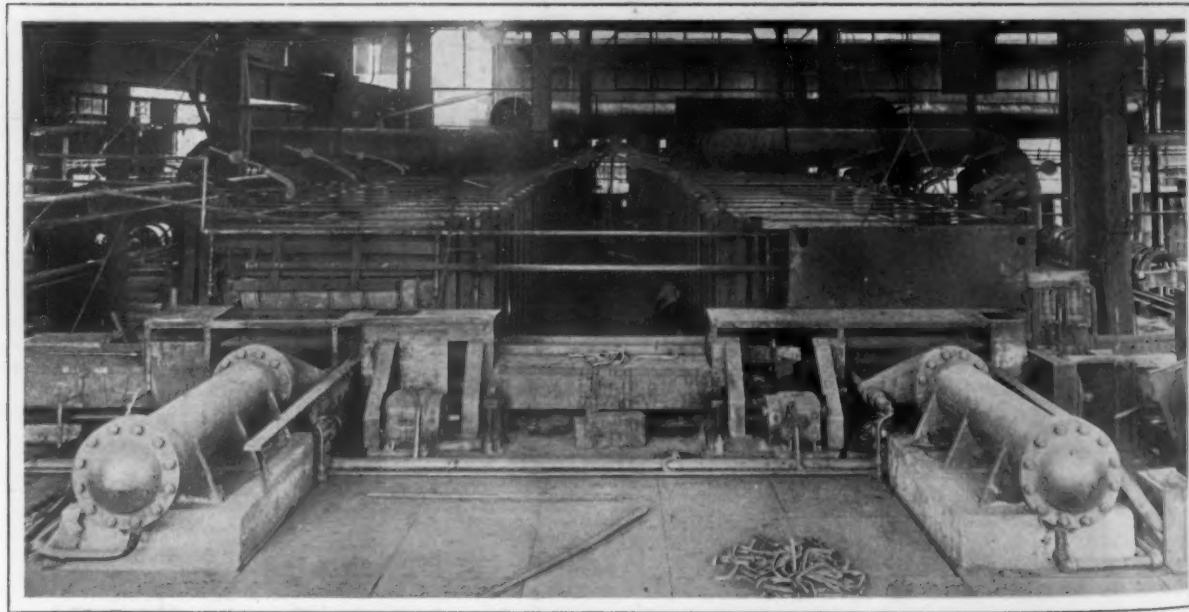


Fig. 2—Continuous Ingot-Heating Furnaces

The Atlanta Steel Company, Atlanta, Ga., some months ago completed an extensive programme of improvements looking to increased output and more economical operation. The Atlanta plant dates from 1901 and a considerable expenditure for enlargements was made in 1905-6. Previous to the improvements of the past year, all of which were made by the Morgan Construction Company, Worcester, Mass., there were two 35-ton basic open hearth furnaces, five heating furnaces, a 25-in. two-

high reversing blooming mill of special design, a rod mill with six stands of continuous and six stands of Belgian rolls, an 8-in. hoop and cotton tie mill, an 18-in. light rail mill, 14 wire drawing blocks, 40 wire nail machines and two automatic spike machines. The annual rated capacity was 45,000 tons of ingots.

For a number of years the company has been making small billets for its finishing mills on its blooming mill, and small ingots were heated in

direct-fired continuous furnaces inconveniently located with reference to the blooming mill and expensive to operate. Two old furnaces have now been replaced with two Morgan gas-fired continuous furnaces arranged to discharge directly on the blooming mill tables. A Morgan six-stand continuous billet mill was also installed back of the blooming mill to receive 4-in. billets from the latter and

turn is now made in one 12-hour turn with great improvement in yield and quality, and the company is in a position to double its output of steel by adding only to its melting capacity. The new mill has furnished an opportunity to take advantage of the cheap hydro-electric power available in Atlanta, and it is driven by a geared electric motor made by the General Electric Company.

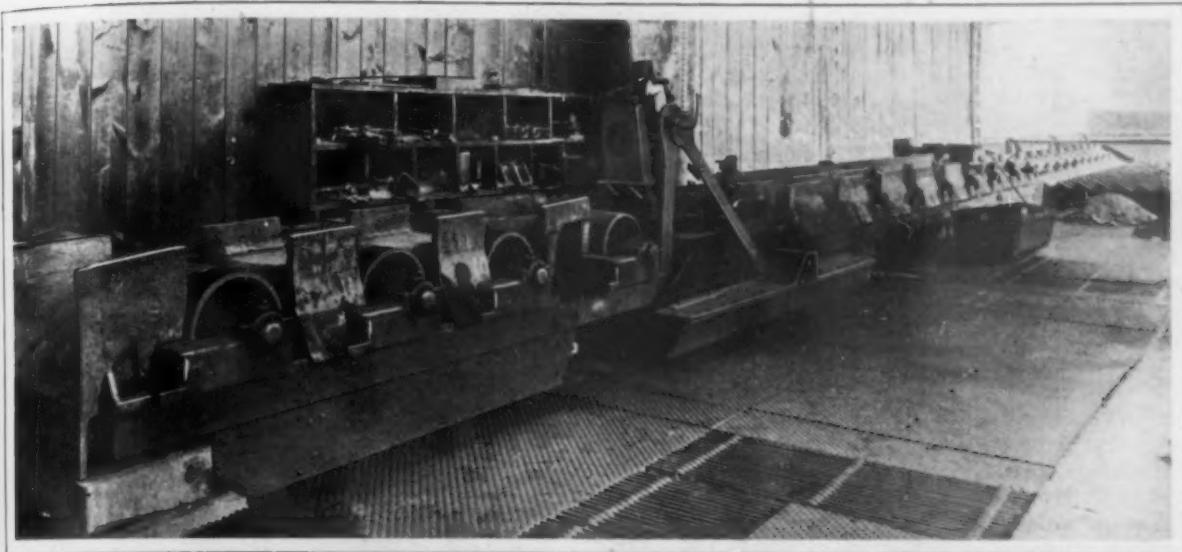


Fig. 3—Flying Shear and Table

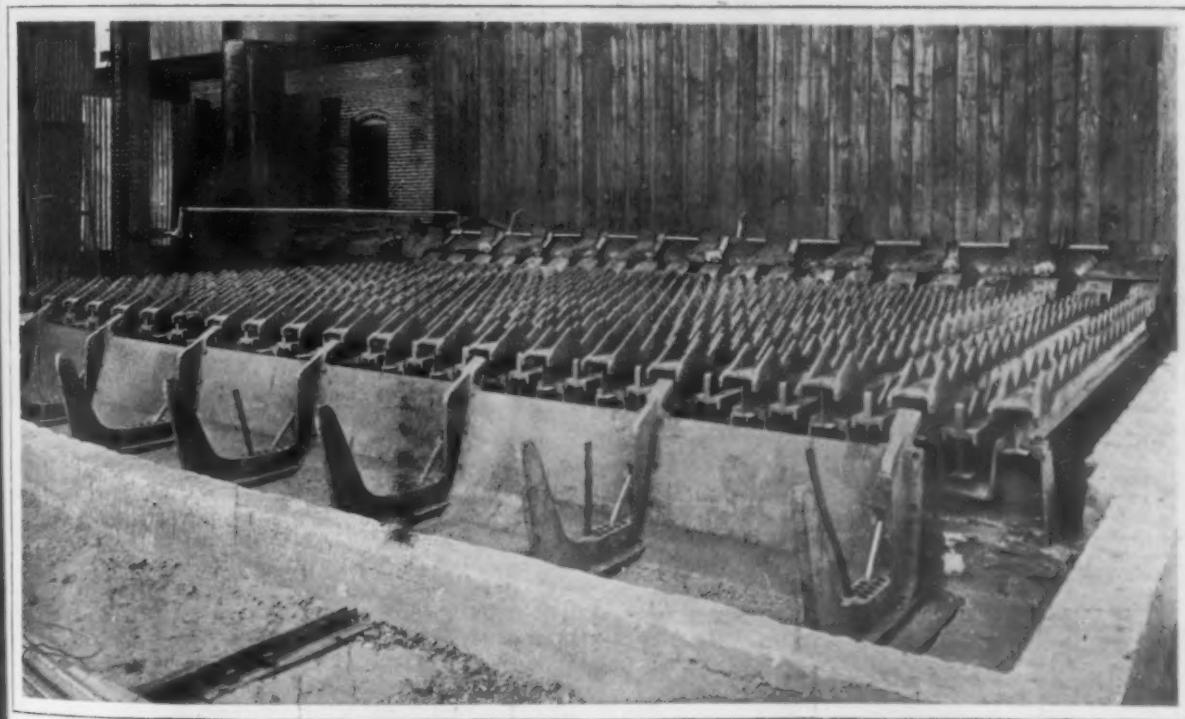


Fig. 4—Traveling Type Notched Cooling Bed

reduce them to 1½ in. and larger billets. The product of the mill is cut up by an Edwards flying shear, and the billets are handled on an automatic notched cooling bed especially designed by the Morgan Construction Company, so that flats and shapes as well as square billets can be handled at some future time. The gas-making plant is of the standard design of the Morgan Construction Company, but the furnaces, mill, shears, tables and cooling bed are of new designs.

On the completion of the improvements the weight of ingots used was increased about 50 per cent. The output of billets formerly made in double

Pennsylvania Steel Company Changes

The Southern business of the Pennsylvania Steel Company, which has been handled heretofore by R. C. Hoffman & Co., Baltimore, Md., will in the future be conducted by J. A. Davis, who has been appointed a district sales manager of the company, with headquarters in Baltimore.

The local sales office of the company in Philadelphia has been consolidated with the general sales office in that city.

F. H. Tackaberry has been appointed assistant general manager of sales. He was formerly manager of the company's Mexico City sales office.

PORTRABLE MOLDING MACHINE

A Recent Air Squeezer Type Having Jolting and Stripping Plate Equipment

Additions have been made to the line of portable air squeezer molding machines built by the Osborn Mfg. Company, Cleveland, Ohio. For some time the two larger sizes have been furnished either as a plain power squeezer or a power squeezer with jolting equipment added. The line has been broadened still more and both the plain and the jolt squeezer machines can be had with a stripping mechanism, this device being supplied with any of the three sizes. The advantages of the use of the stripping attachment are that it operates automatically and gives a draw without employing skilled labor and at the same time the speed at which the flask is stripped from the pattern is just one-half the speed at which the head is lowered. This speed can be varied to suit the requirements of any particular case.

The air squeezing machine which is the foundation of this series is automatic in its application of power to the squeeze. The advantage of the jolt squeezer combination is that a few jolts before squeezing will, it is emphasized, prevent ram-offs and defective molds, eliminate tucking and also speed up production.

The stripping operation is automatic, but can be performed by hand without making any adjustments or changes in the machine. It can be used either with or without stripping plates and the flask-lifting pins are adjustable both in and out and also up and down, to give adjustments for a wide range of sizes up to the maximum flask capacity of the squeezer. In the stripping operation the flask is put on and the mold made as on the company's regular machine, the operator simply pushing down the handle of the operating valve. This causes compression to be applied up to the point at which the release valve has been set when the machine is automatically returned to off position. A separate knee valve is employed to operate the jolt if that is used. The stripping device is partly attached to the squeezing head and as this descends to make the squeeze, the stripping mechanism is raised from the working position. After the mold has been squeezed and as the head is descending, the flask comes in contact with the stripping pins and the pattern is automatically drawn.

Another addition to this machine is a small machine with an 8½-in. cylinder measuring 30 in. between the rods. This is designed to straddle the

sand heaps and the legs are spread far apart. This arrangement, it is pointed out, increases the practical usefulness of the portable feature of the machine.

A New Car for Handling Coal to Boilers

The Orenstein-Arthur Koppel Company, Koppel, Pa., has designed a type of dump car for handling coal to boilers, which dumps only part way as shown in the illustration. It remains in this position so that the material can be shoveled out easily and rapidly. The car was designed for running over the floor and

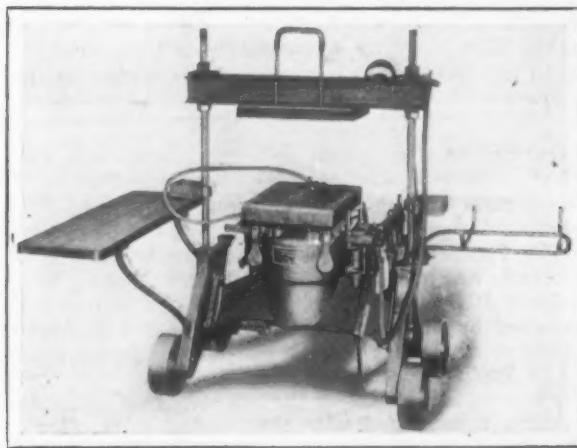


A Recently Developed Part Way Dump Car for Transporting Coal Between the Bunkers and the Boilers

has flangeless wheels and a swivel front axle with a handle so that it can be pulled in any direction. The underframe is made of the builders' special wide flange channel and roller bearings. When the car is being loaded it remains in normal upright position, but during unloading it is tipped to the position shown and is held in place by an adjustable calk which fits under the rockers.

Newark Foundrymen's Association

The Newark Foundrymen's Association, Newark, N. J., held its last meeting of this season June 3, President H. P. Macdonald, Snead & Co. Iron Works, presiding. After the usual dinner and business meeting, the members were addressed by W. S. S. Coleman, an insurance expert, who explained a plan for forming a mutual insurance company designed to afford protection against employers' liability as it exists under the laws of New Jersey. The subject was referred to the executive committee for further consideration. Two new members were elected—the McNab & Harlin Mfg. Company and J. M. Ellis, representing the Bethlehem Steel Company. Resolutions were adopted expressing appreciation of the aid given to the association by A. E. Barlow, Barlow Foundry Company, during the several years he had served as secretary.



A Molding Machine of the Air Squeezer Type Equipped with Both Jolt Ramming and Stripping Plate Mechanisms

The distribution of accidents in 1913 in the plants of the Pullman Company has been made under 36 general heads, and a striking anatomical chart has been drawn for indicating the distribution. Seven of the classes into which the accidents are grouped are as follows: Eye, 35 per cent.; fingers, 18.3 per cent.; hand, 5.8 per cent.; thumb, 4.3 per cent.; feet, 4.3 per cent.; toes, 4.2 per cent. and wrist 3.1 per cent. This leaves 25 per cent. of the accidents to be distributed over the remaining 29 different classes.

A Universal Wood-Working Machine

A new model of universal wood-working machine has been developed by the Crescent Machine Company, Leetonia, Ohio. It consists of five parts, a band saw, a saw table and jointing, shaping and boring machines, all of which are mounted so that any of them can be used independently and the machines that are not in use do not have to be operated, as each part of the machine has a separate lever for starting and stopping it. It is stated that as many as four of the machines can be in use at the same time and each of the operators can control his own machine independently of the others and without any interference on some parts of the work.

A single casting with planed surfaces or pads upon which the various machines and parts are mounted is employed for the base. It has been found that this construction of the base insures stiffness, accuracy in alignment and also eliminates vibration when running. It is also pointed out that there are no difficult or complicated changes of adjustment to be made for doing different kinds of work as each machine is always in readiness for instant operation. The main driving pulley is located between the pulley for the band saw and the friction cones for the shaping machine. The machine can, therefore, be belted from above or below or from the rear or at any intermediate angle. Endless leather belts are furnished with the machine for driving each part and are located within the machine so that they are entirely out of the way. With the exception of the shaping machine the starting and stopping of the various parts is by a belt-tightening pulley, actuated by a lever. Friction cones are employed for starting, stopping or reversing the shaping machine.

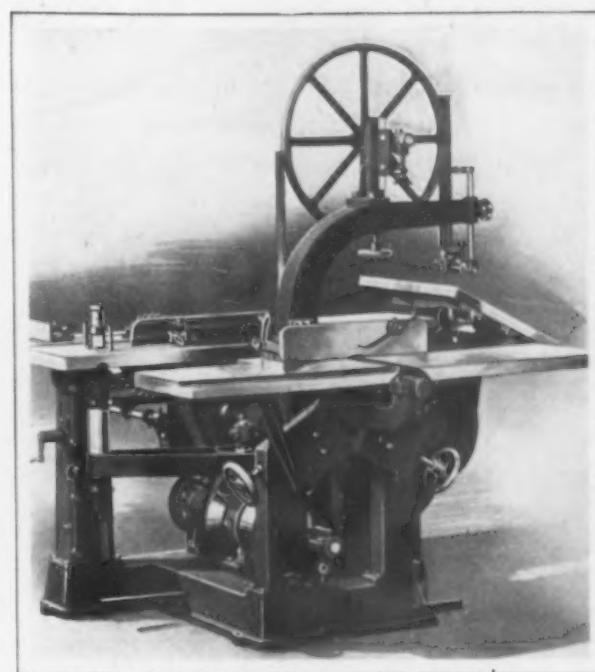
The band saw, in its general construction, is similar to the company's standard line, the frame being cast in one piece, with a cored out hollow rectangular section. The bearings for the shaft are adjustable for wear and there are two on the lower shaft with the pulley mounted between them.

The handle for controlling the motion is at the front of the machine within easy reach of the operator. The table can be tilted as shown to any angle up to 45 deg. for sawing bevels. An adjustable ripping fence or gauge is furnished.

The main body of the jointing machine is the one-piece hollow casting, which is securely bolted to a pad on the base. The tables slide on dovetailed inclines which are cast solid with the body and have gibbs to take up wear. The tables are raised and lowered by screws which are operated by hand-wheels. The front bearing of the head is carried by an arm casting which is cored out. There is an offset along the side of the table for doing rabbeting. The starting lever is located under the front table where it can be conveniently operated by the foot. As regularly built, a four-sided square head with two sides tapped for using regular straight knives and two sides with T-slots for attaching special cutters is supplied, but the round safety head of the builder which was illustrated in *The Iron Age* May 26, 1910, is recommended.

The shaping machine, which is of the single-spindle reversible type, is mounted on the rear of the saw table. The lever for operating the motion of the cutters is placed in the base of the machine for foot operation and the motion of the knives is reversed by friction cones placed on the driving shaft.

The saw table framework is cored out hollow to give stiffness and the rear column also acts as a frame for the shaping machine. When wide lum-



A Recently Developed Wood-Working Machine of the Universal Type Combining a Band Saw, Saw Table and Jointing, Shaping and Boring Machines in a Single Unit

ber is to be ripped, the shaping spindle is lowered entirely below the table, the top of which is then clear. There are two ways planed into this table for using the adjustable cut-off fence and for other special work. Any bevel up to 45 deg. either right or left can be cut. The table can be tilted and there is a removable wooden throat piece which adapts the machine for grooving and other special work.

The table of the boring machine slides horizontally on round steel ways, stop-collars being provided to regulate the depth of holes. A screw with a detachable handle adjusts the table for height. The spindle, which is 1 1/4 in. in diameter, has a 1/2-in. hole to receive the shanks of the bits or the shank of the self-centering chuck that is regularly furnished. A lever and tightener pulley control the operation of the spindle.

The equipment furnished with the machine enables all of the ordinary operations to be performed and a number of special attachments can also be supplied. These include a ripping fence or gauge for use with the band saw, a round jointer head, steel lips for the ends of the jointing machine table, tenoning and panel raising attachments for use in connection with the shaping machines, a saw guard, dado and groover heads, knife and disk grinding attachments, a hollow chisel mortiser, a spoke tenoner and a plain emery wheel. The emery wheel and the disk grinding attachments are intended for use on the boring machine and are mounted on the spindle.

L. Vogelstein & Co., 42 Broadway, New York, furnish the following figures of German consumption of foreign copper for the months January to April, 1914: Imports, 78,887 tons; exports, 2479 tons; consumption, 76,358 tons. The consumption in the same period of 1913 was 69,169 tons. Of the imports stated, 69,434 tons came from the United States.

The Gordon Iron Company, old material, Chicago Heights, Ill., has just purchased two coal docks from the Clarkson Coal & Dock Company at Duluth, Minn., and is now wrecking them. These two docks are among the largest on Lake Superior, and the undertaking shows the kind of work the Gordon Company is equipped to handle for wrecking expeditiously.

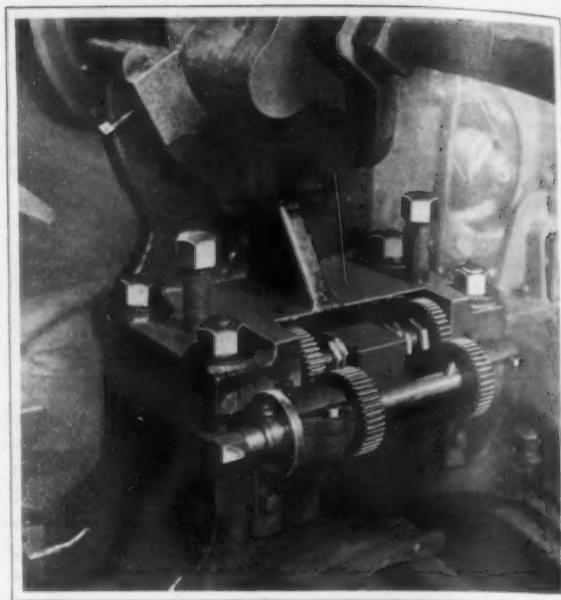
NEW ROLL GRINDING MACHINE

An Improved Type Having a Special Mechanism for Securing Tapers

The A. Garrison Foundry Company, Pittsburgh, Pa., has made a number of changes in the construction of its roll grinding machine. This machine as originally built was illustrated in *The Iron Age*, December 12, 1912, but the new features that have been added make the machine practically a new tool. The special feature of the machine, which is designed to grind and polish rolls having a maximum diameter of 32 in. and necks which are not more than 9 in. smaller in diameter than the body, is the mechanism provided for tapering the roll.

It will be noticed from the illustration that the bed is very wide and heavy. It is of double box shape and has V-ways with automatic oil wells, this construction being similar to that of a heavy planing machine. Three motors, each of which acts independently of the others, are employed to drive the machine and variations in their speeds are secured by rheostats. The gearing which rotates the roll is of the double spiral type and is cut from a solid blank. Two grinding wheels on opposite sides of the roll are used in order that accurate work may be done and enable a roll to be ground within 0.0005 in.

The wheels used are 15 in. in diameter with 2-in. face and are driven by motors located on the carriage. In this way the necessity of overhead belts is eliminated and free use of a crane for handling work to and from the machine is rendered possible. The motors driving these wheels are of special construction and are protected from water. As a precaution against damaging the motors by driving wheels too hard, circuit breakers are supplied for each of the motors. The wheels are mounted on centers and the arrangement is such that they may be removed in a short space of time. The wheel and the arbor together weigh less than 70 lb. and as the machine has one or more extra arbors and wheels, the change can be made much more rapidly than if a large wheel mounted on a mandrel running in bearings were employed. The wheels are of the safety type with enlarged centers which prevent pieces flying if a wheel should crack, the de-

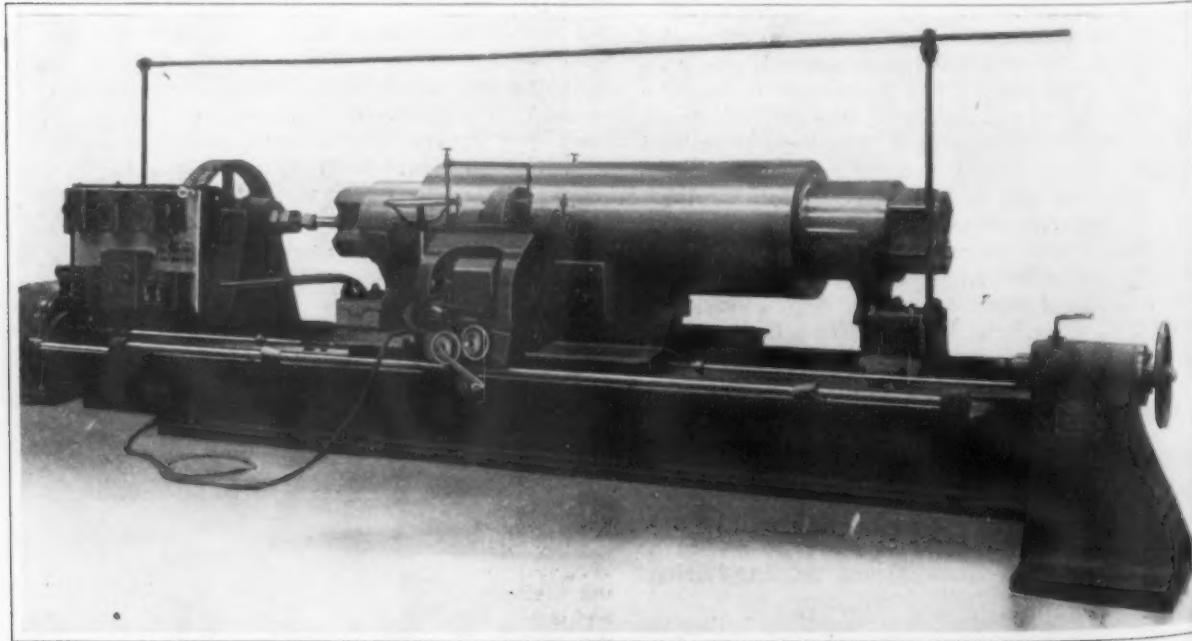


The Mechanism for Moving the Center Line of the Roll Out of Parallel with That of the Machine to Provide for Tapering of the Roll

sign being the same as that which has been adopted by the United States Steel Corporation. The hoods for protecting the wheels are of cast steel.

The tapering of the roll is obtained by moving the center line of the roll out of parallel with that of the grinding wheels. When the roll is placed in the housings in which it is rotated, the two nuts, having toothed edges, are screwed up against the lugs on the bearing and by using a wrench on the square end of the shaft, the roll is thrown until it is exactly parallel with the line of the grinding wheels. After this has been done, the graduated disk, which is secured to the shaft by the thumb screw, is set at zero, and by turning the shaft with a wrench on the square end as before, the roll can be thrown over as much as is required, this amount being shown in thousandths of an inch on the graduated disk. It is common practice to turn the rolls with a taper at each end and straight in the middle, and this is accomplished to any desired specifications rapidly and easily.

The carriage is reversed and the wheels fed in



A New and Improved Type of Machine for Grinding and Polishing Rolls Having a Maximum Body Diameter of 32 in.

automatically at the end of each cut, the cross feeds being provided with micrometer adjustments. A hand feed for necking and for grinding the fillets is provided as well as adjustments by which a roll may be turned either hollow in the middle or crossed, as it is usually termed, or may be tapered at the ends. The shipping weight of the machine complete is about 40,000 lb.

CHANNEL AND T PASSES

Their Relation to the Pitch Line from a German Viewpoint

The proper placing of channel and T passes in relation to the pitch line was discussed in a recent paper by A. Lübke, of Aachen, in *Stahl und Eisen*.

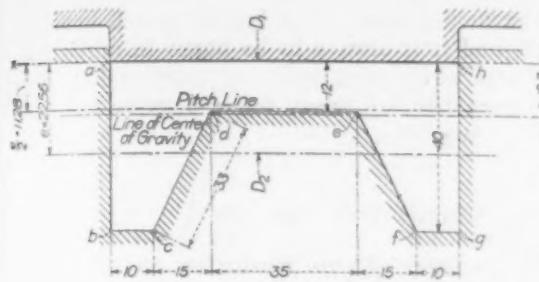


Fig. 1—Closed Pass

This is in continuation of a previous paper which was abstracted in *The Iron Age*, October 30, 1913. Mr. Lübke investigates the velocity of the upper and lower rolls, and based on this determines the theoretical pitch line.

A channel is first taken up, shown in Fig. 1, as a closed pass, and in Fig. 2 as an open or live pass. The following can be worked out regarding Fig. 1. The upper roll operates with a diameter D_1 , the

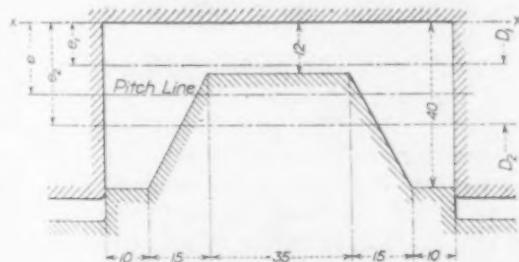


Fig. 2—Open or Live Pass

lower roll with the diameter D_2 . The latter is removed a distance e from the line xx . This distance e can be calculated as follows:

$$e = \frac{2.40.20 + 2.10.40 + 2.33.26 + 35.12}{2.40 + 2.10 + 2.33 + 35} = 22.56 \text{ mm.}$$

The pitch line is 11.28 mm. or $\frac{e}{2}$ from the line xx , so that $D_1 \times e = D_2 \times \frac{e}{2}$.

In Fig. 2 the diameter D_1 of the upper roll is 9.7 mm. from the line xx .

$$e_1 = \frac{2.40.20}{2.40 + 85} = 9.7 \text{ mm.}$$

The distance e_1 from D_1 to the line xx is calculated as follows:

$$e_2 = \frac{2.10.40 + 2.33.26 + 35.12}{2.10 + 2.33 + 35} = 24.3 \text{ mm.}$$

The pitch line is then 17 mm. from the line xx .

$$e = \frac{e_1 \times e_2}{2} = \frac{9.7 \times 24.3}{2} = 17 \text{ mm.}$$

In the first case each roll exerts an equal pressure, there is little work on the guides, and backlash is not to be feared. In the second case if an overpressure of 8 mm. is brought about the pitch line will be 15 mm. from the line xx . In Fig. 1 the line of the center of gravity is also shown, its distance s is 12.3 mm. The method proposed by Tafel would have the pitch line 12 mm. from xx , that of Puppe 12.3 mm. (through the center of gravity), and the present one 11.28 mm., while that of Schaefer would be 6 mm. The first three are practically alike in this case.

Fig. 3 is next taken up. First, without indirect pressure:

$$e_1 = \frac{54.6 + 60.6}{60} = 11.4 \text{ mm.}$$

$$e_1 = \frac{11.4}{2} = 5.7 \text{ mm.}$$

under the line xx . This result agrees almost exactly with that of Tafel.

Second, with indirect pressure:

$$e_2 = \frac{2.6.3 + 6.54 + 2.54.33 + 60.6}{2.6 + 5.4 + 2.54 + 6} = 23.8 \text{ mm.}$$

$$e_2 = \frac{23.8}{2} = 11.9 \text{ mm.}$$

In this case the pitch line is $\frac{e_2}{2} = \frac{11.9}{2} = 5.95 \text{ mm.}$ under the line xx . The line of the center of gravity is 17.2 mm. from xx , so that here they are not to-

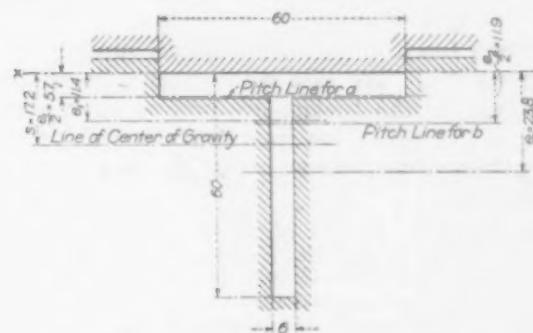


Fig. 3—Pitch Line for a T-Section

gether. In order to avoid backlash the upper roll must produce an over-pressure of 21.2 mm. The method given above, which can also be applied to the passes of continuous mills, can be used for any section.

G. B. W.

Amalgamated Wage Scale Conferences

A conference between wage committees of the Amalgamated Association and the Western Bar Iron Association is being held at Atlantic City, N. J., starting Tuesday, June 9. As the puddlers have asked an increase of 75c. a ton it is not expected that a settlement of the puddling scale will be reached at this meeting. It is known that the bar-iron makers in the West are strongly opposed to granting any increases in scales of wages at the present time. On Tuesday, June 16, a conference will be held at Atlantic City between wage committees of the Amalgamated Association and the sheet and tin-plate mills that sign the Amalgamated scale. As very few changes are suggested in the new scale to be effective from July 1, it is believed that a settlement will be reached without trouble.

The General Roofing Mfg. Company, East St. Louis, Ill., has opened a branch in Cincinnati, Ohio, in charge of R. T. Shaw, sales manager, and D. W. Dean, assistant sales manager. Offices have been secured in the Union Central Building. The company manufactures Certain-teed roofing.

ESTABLISHED 1855

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New York Harbor Steel Works

The Industrial Bureau of the Merchants' Association of New York has given the results of its long inquiry into the advantages of a New York harbor location for the manufacture of iron and steel in a 33-page pamphlet. Some of the arguments set forth in these columns ten years ago reappear, with the addition of some which have developed in the decade, such as free iron ore, cheap freights on New York State magnetite with the opening of the Champlain Canal, important discoveries of iron ore which are available to a New York plant at low water freights, and the new economies of by-product coke manufacture. The facts are marshaled with a degree of skill, albeit the well-recognized touch of the non-technical promoter is not infrequent. The ease with which some of the conclusions of the booklet are arrived at is suggested by this paragraph from the review of it sent out by the publicity bureau of the Merchants' Association:

The Industrial Bureau of the Merchants' Association has decided to transfer Pittsburgh to New York. To accomplish this, it will take advantage of fundamental changes affecting the development of the iron and steel industry, which are creating a complete readjustment in the source of the ore supplies and the arrangement of the trade routes. As a result, the center of the iron and steel industry is moving eastward, drawn by the magnet of economy towards the Atlantic seaboard, and New York harbor is the strategic point on the Atlantic seaboard for the production of iron and steel.

What a tidewater plant can do in reaching foreign markets has long been urged. It was the deciding argument for the Sparrows Point site and it was the ground of high and thus far unrealized expectations for the Dominion works in Nova Scotia. Assembling costs often look attractive and actually are; but the Southern steel industry is a monumental illustration of the danger of counting too heavily for profits on mere cheapness of ore, fuel and flux. New York harbor blast furnace projects have long been under consideration and they call for a better hearing to-day than they have ever had. But too much stress should not be laid on the necessity of moving to the seaboard to repel the European invader, and it should not be forgotten that an Atlantic seaboard steel works has the richest market of the world all to the west of it and much of the best of that market some hundreds of miles to the west of it. Moreover, the Underwood tariff is not a finality and investments of millions in steel plants are not likely to be made in response to the plea that "threatened foreign competition" must be met where it first sets foot on American soil.

In good time additions will be made to our steel-making capacity on the Atlantic seaboard, but there are under way no "fundamental changes affecting the development of the iron and steel industry," as the Merchants' Association bureau would have us believe, and it is always to be borne in mind that the things which have made or unmade iron and steel enterprises are rarely found between the covers of a prospectus.

Coke Production Statistics

The statistics of coke production in 1913, just published, show a further increase in the output of by-product coke. Of the total coke manufactured last year 27.4 per cent. was by-product, while in 1912 the proportion was 25.2 per cent. If the total demand for coke had not been as large as it was, the proportion of by-product would undoubtedly have been greater. The by-product ovens usually run, while variations in demand from year to year are absorbed chiefly by the beehive ovens. Thus in 1909, a year of large production, the by-product coke comprised a slightly smaller percentage of the total than in 1908, when total production was light.

In recent years coke production has maintained a fairly constant relation to pig-iron production. Statistics for every fifth year to 1908 and for each year thereafter are given in the table below, which shows also the number of net tons of coke per gross ton of pig iron produced, also the percentage which the by-product output bore to the beehive output, the computation being on the basis that should this proportion rise to 100 per cent. the quantities of beehive and by-product coke would be identical.

Production of Coke in Net Tons and of Pig Iron in Gross Tons

Year	Beehive.	By-product.	Total Coke.	By-product per cent. of Beehive.	Coke to 1 ton pig iron.									
					1893..	1898..	1903..	1908..	1909..	1910..	1911..	1912..	1913..	
1893..	9,464,730	12,850	9,477,580	0.1	7,124,502	1.33								
1898..	15,752,764	294,445	16,047,209	1.9	11,773,934	1.36								
1903..	23,391,887	1,882,394	25,274,281	8.1	18,009,252	1.40								
1908..	21,832,292	4,201,226	26,033,518	19.2	15,936,018	1.64								
1909..	33,060,421	6,254,644	39,315,065	18.9	25,795,471	1.52								
1910..	34,570,076	7,138,734	41,708,810	20.6	27,303,567	1.53								
1911..	27,703,644	7,847,845	35,551,489	28.4	23,649,547	1.50								
1912..	32,868,345	11,048,489	43,916,834	33.6	29,726,937	1.48								
1913..	33,596,669	12,714,700	46,311,369	37.9	30,966,152	1.50								

Production of pig iron in the first half of this year promises to be about 12,500,000 tons, and should the second half bring no change the year's output would be 25,000,000 tons, and the output of

coke could be forecasted at about 37,500,000 tons. The by-product production, however, would probably show an increase over 1913, as there would be heavier production in the South, and in the North additional by-product capacity, as at Youngstown and one or two Eastern plants, is in operation. The proportion of by-product to beehive would probably be 50 to 55 per cent., against 37.9 per cent. in 1913, and the proportion of by-product to total coke about 35 per cent., against 27.4 per cent. in 1913.

The New Attitude on Iron Ore

The sale of an important Lake Superior ore mine by the Cambria Steel Company to the Cleveland-Cliffs Iron Company is of more than passing interest. The abrogation of the Hill lease by the Steel Corporation has helped to make ore plentiful. The philosophy of the steel trade appears to be that the question of ore supply will take care of itself. The less the present is burdened to take care of the future the more cheaply steel can be made.—American Metal Market.

Sales of Lake Superior iron ore in the open market by steel companies and producers of pig iron point to the same change of mind on the question of ore. Large furnace interests and large independent steel companies which have made such sales were supposed, when they took up Lake Superior iron properties, to be safeguarding their future by acquiring every ton of ore in the ground on which they could meet interest charges. They have found, however, that an occasional ore sale serves a good purpose in meeting bonded interest and sometimes helps to pay a dividend. Much was written 10 or 12 years ago about competitors of the Steel Corporation who in the next 25 years would be gasping out their lives alongside of their exhausted ore pits while the corporation, with its enormous ore reserves, went on in undisturbed security. So much of that purport was printed, in fact, that the iron trade was in a state of semi-panic over the ore question.

Cuban and South American developments, along with constant additions to the supply of Lake Superior ore in sight, have been factors in completely changing the viewpoint. The iron trade has at last come to an appreciation of the warning given years ago by the Reading Railroad receivership and other examples of wholesale preoccupation of mineral properties against the far distant future. One valuable service of the Steel Corporation suit to the industry was the vast amount of reliable testimony it brought out, to the practically inexhaustible extent of the iron ore available to the steel companies of the United States. The Hill lease put a burden on every ton of steel the Steel Corporation produced and its continuance would have meant a yearly increasing handicap to the corporation in meeting the competition of Germany in the markets of the world.

Against Instalment Buying

The instalment plan of credit has developed to such formidable proportions in some communities that manufacturers are beginning to take steps to put an end to the practice so far as it affects their workmen. Already notices have been posted at some works saying that employees who place themselves under this form of obligation are liable to dismissal. The result is that not only does

the employee fear to take the chance of incurring the penalty, but the instalment house, learning the conditions existing in the plant, must hesitate to extend credit which would jeopardize the customer's income and consequently his ability to meet the obligations of the "lease," as the contract is called. Though the credit is based on the goods, the merchant does not care to take back worn clothing or used furniture, at any rate until a sufficient amount of the bill has been paid, nor does he desire to go to the length of actually seizing the goods.

Many of the houses that sell on the instalment plan are wholly reputable. A few of them make the price the same for credit as for cash. Many of them add to the cash price only enough to take care of the interest on the capital tied up. The cost of collection and the risk of the dishonest buyer may also be taken into account. Musical instruments, sewing machines, furniture and many other conveniences and luxuries, the cost of which is often considerable, are marketed in a great and growing volume on this basis. And there are dealers who are not so scrupulous in their charges. They live upon the vanity and easy-going habits of their customers, who pay extravagantly as compared with what they could do for cash.

But whatever the circumstances, the employer usually frowns upon the practice. He holds that the average workman should not go in debt for such purchases unless to do so is absolutely unavoidable. As for luxuries, no good reason can be given in favor of a debt. To receive credit unnecessarily is not good for the man of small means, especially where he cannot be sure of the tenure of his service. Frequently employers are subjected to annoyance because employees who have not kept up with payments, and are hard pressed by collectors, ask for advances of wages to prevent the loss of goods paid for in part. It is not that the employer has any desire to interfere with the employee's freedom of action; but the number of cases in which employers, quite against their will, are brought into these transactions have led some of them to take a decided stand against the instalment system.

For a Textile Machinery Association

The exposition of textile machinery recently held in Boston has given an impetus to the idea of creating a national association of textile machinery manufacturers, with functions similar to those of the National Machine Tool Builders' Association. This latter organization has been of vast benefit to its members and the trade as a whole, and to manufacturers of the accessories that actually enter into the product, such as electric motors, bearings and clutches; also to manufacturers of small parts, such as machine screws and gears, and of such appurtenances as chucks. All such manufacturers share with the members in the advantages of an intimate interchange of ideas and experiences, and what is very important, in the standardization. This last has proceeded a little slowly, but none the less surely, until the products of many houses the machinery trade patronizes have been considerably simplified, which

means lower costs and presumably lower selling prices.

Of course, the social side is an exceedingly valuable feature of association work. Competitors are brought together under circumstances most favorable for friendly acquaintance. Among the machine tool builders present day relations are very different from what existed before the association brought them together some 10 years ago.

The textile machinery industry is marked by keen rivalry in the various lines. Competition from foreign builders has been felt much more seriously than is the case in iron working machinery; hence there is all the more reason for getting the benefits of associated effort. The business has somewhat extended in scope, though textile machinery is more highly specialized than it used to be. The mill requires a greater variety of equipment for the modern refinements of product and for more economical manufacture. An association of the machinery builders would have a great many members, if all should come in. They could be divided into groups according to the types of machines manufactured, to consider specialized questions, just as the machine tool builders are divided for deliberations on matters that concern sections of the industry. The work of standardization would begin with products of manufacturers who contribute to the building of textile machinery, including, as with machine tools, motors, clutches and bearings and so on through a long list of general supplies.

The plan to establish the new association may not work out immediately, but it is almost certain to do so after a time. The manufacturers of textiles have their organization, and it is in connection with their conventions that the exposition of machinery has been given for several years. The beneficial results of this form of co-operation should in themselves prove a strong factor in bringing the new association into existence.

Copper Production for May

The report of the Copper Producers' Association for May shows the stock of copper on hand June 1 to be 84,342,641 lb. This is an increase of 14,005,640 lb. over the amount on hand May 1 which then was 70,337,001 lb. The association's statement for May compares as follows with that for April:

	May Pounds.	April Pounds.
Stock of marketable copper of all kinds on hand at all points in the United States at the first of the month	70,337,001	64,609,319
Production of marketable copper in the United States from all domestic and foreign sources in the month	142,308,287	151,500,531
Deliveries of marketable copper in the month for domestic consumption	55,592,170	63,427,633
For export	72,710,477	82,345,216
Total	128,302,647	145,772,849
Stock of marketable copper of all kinds on hand at all points in the United States, at the close of the month	84,342,641	70,337,001

The production of copper in May was 142,308,287 lb. which is a decrease of 9,192,244 lb. from April's record. Foreign deliveries, totaling 72,710,477 lb., declined 9,634,739 lb. from the April record of 82,345,216 lb. Domestic consumption also fell off to 55,592,170 lb., a decline of 7,835,463 lb. from the April consumption. The total decrease in consumption was therefore 17,470,202 lb. in May, as compared with April.

IMPORTS MORE—EXPORTS LESS

Our Foreign Trade Not Encouraging to Business Interests

WASHINGTON, D. C., June 9, 1914.—Something of the true inwardness of the present business situation—denominated a "psychological depression" by President Wilson—is reflected in statistics of imports and exports just compiled by the Department of Commerce and made public almost coincidently with Secretary Redfield's assurance to the President that our foreign trade is improving. The figures are being examined by majority leaders in Congress with interest not unmixed with anxiety, showing as they do most conclusively that our favorable trade balance is melting away like snow in August sunshine, while the tendency of customs revenues is such as to render the country more than ever dependent upon the somewhat problematical success of the new income tax law.

The figures prepared by the Department of Commerce cover the 10 months ended April 30 of the current year, as compared with the same period of 1913, and show total imports of \$1,572,438,054 for this year, as compared with \$1,548,038,644 for 1913, an increase of more than \$24,000,000. For the 10 months of 1914 exports aggregated \$2,018,083,447 as compared with \$2,077,277,678 for the same period a year ago, or a loss of about \$59,000,000. The combined statistics show a decrease in the favorable trade balance of about \$83,000,000 for the 10 months, or at the rate of approximately \$100,000,000 per annum. The classification of imports and exports for the two 10-month periods is given as follows:

Imports: Crude materials for use in manufacturing, 1913, \$583,404,090; 1914, \$520,344,419. Foodstuffs in crude condition and food animals, 1913, \$184,187,182; 1914, \$210,169,827. Foodstuffs partly or wholly manufactured, 1913, \$163,516,882; 1914, \$176,652,010. Manufactures for further use in manufacturing, 1913, \$292,240,550; 1914, \$269,849,425. Manufactures ready for consumption, 1913, \$356,636,245; 1914, \$380,760,889; miscellaneous, 1913, \$13,023,695; 1914, \$14,661,484.

Exports: Crude materials for use in manufacturing, 1913, \$655,178,548; 1914, \$722,056,256. Foodstuffs in crude condition and food animals, 1913, \$161,671,083; 1914, \$116,330,048. Foodstuffs partly or wholly manufactured, 1913, \$271,726,527; 1914, \$252,650,662. Manufactures for further use in manufacturing, 1913, \$340,478,584; 1914, \$312,500,818. Manufactures ready for consumption, 1913, \$640,994,412; 1914, \$605,305,040. Miscellaneous, 1913, \$7,228,524; 1914, \$6,240,621.

THE WHOLE IMPORT SIDE DEPRESSING

It is difficult to find in these figures a rational basis for Secretary Redfield's optimistic declaration to the President. Of the six classifications of imports employed by the Department of Commerce, four show substantial increases, while the decreases in crude materials for use in manufacturing and in manufactures for further use in manufacturing indicate reduced activity on the part of the industries of the United States. Thus, the whole import side of the ledger is depressing. Turning to the exports, it is seen that a material decline is noted in every classification except in that covering crude materials for use in manufacturing. It may be assumed that if these materials could be profitably manufactured at home under existing conditions there would certainly be no increase in their exportation, and as this increase of about \$67,000,000 is accompanied by a decrease of \$28,000,000 in exports of manufactures for further use in manufacturing and \$32,000,000 in exports of manufactures ready for consumption, or a total of \$60,000,000 for the two classes, further argument on this score seems superfluous.

In this connection it should be borne in mind

that the 10-month period covered by these figures includes the months of July, August and September under the Payne-Aldrich tariff law. Had the statistics been confined to the seven-month period ended April 30, they would have been even more discouraging. The figures for the month of April, 1914, as compared with 1913, are certainly startling, showing as they do a decrease in exports of nearly \$38,000,000 and an increase in imports of more than \$27,000,000, or a net change in trade balance of \$65,000,000 for the month, which is at the rate of \$780,000,000 for the year—rather more than enough to extinguish entirely last year's favorable balance. The decrease in exports for the month of April, 1914, included the following items: Crude materials for use in manufacturing, over \$10,000,000; foodstuffs in crude condition and food animals, about \$7,000,000; foodstuffs partially or wholly manufactured, more than \$6,000,000; manufactures for further use in manufacturing, more than \$5,000,000, and manufactures ready for consumption, more than \$8,000,000.

THE FARMER SUFFERING

An additional statement prepared by the Department of Commerce covering the imports and exports of foodstuffs in the six months ended March 31, 1914, being the first half of the year under the new tariff, as compared with a like period in 1913, shows that the American farmer has suffered under the new tariff to quite as great an extent as the manufacturer. These figures show an increase in importations of food products, both partially or wholly prepared for use, amounting to over \$30,000,000. In the same period the exports of crude foodstuffs declined over \$60,000,000 and manufactured food products \$18,000,000.

It thus appears that in the first six months under the new tariff there was a gain in imports of foodstuffs of \$30,000,000 and a loss in exports of \$78,000,000, or a change in the trade balance of no less than \$108,000,000 in a single class of merchandise. This astonishing exhibit is accounted for by the Department of Commerce on the ground that "home consumption of domestic foodstuffs has so nearly overtaken home production that the United States is not only reducing its sales of foodstuffs abroad but drawing more largely upon the foreign markets for certain of its food requirements." Protective tariff leaders in Congress scout this explanation, which involves the assumption that current consumption of food products is at a rate of approximately \$220,000,000 per annum greater than a year ago, notwithstanding the fact that there has been practically no reduction in the cost of living. The protectionists declare that the effect of the new tariff law, so far as foodstuffs are concerned, has been to displace large quantities of domestic with foreign products to the injury of producers whose products are raised at such a distance from the markets that they cannot be transported and sold in competition with foreign goods and therefore largely go to waste.

In this connection the interesting fact is cited that in 1898, the first year under the Dingley act, the imports of foodstuffs amounted to but \$190,000,000, while the exports were valued at \$590,000,000, a favorable balance of \$400,000,000. If the first full year under the Underwood tariff bears out the tendencies of the first six months the imports of foodstuffs will aggregate about \$488,000,000 and exports only about \$435,000,000, or an adverse balance of about \$53,000,000 and a change in balance compared with the first year under the Dingley act of more than \$450,000,000.

CONTENTS

Improving the Operation of Core Ovens.....	1451
Large Testing Transformers for Japan.....	1452
Structural Steel in Machine Design.....	1453
Results of Applied Scientific Management.....	1454
Shipments of Long Rods.....	1455
The Bethlehem Steel Company's Tofo Mines.....	1456
Molybdenum and Corrosion of Steel.....	1458
Electric Rolling Mills.....	1459
Lake Iron Ore Shipments in May.....	1460
The Magnet in the Foundry.....	1460
An Improved Electrical Monorail System.....	1461
A Large Special Cast-Iron Pulley.....	1461
Late Developments in By-Product Coke Ovens.....	1462
A Mechanical Lathe Reversing Device.....	1466
The Electric Iron and Steel Industry.....	1466
Progress at Panama-Pacific Exposition.....	1467
Atlanta Steel Company's Billet Mill.....	1468
Pennsylvania Steel Company Changes.....	1469
Portable Molding Machine.....	1470
A New Car for Handling Coal to Boilers.....	1470
Newark Foundrymen's Association.....	1470
A Universal Wood-Working Machine.....	1471
New Roll Grinding Machine.....	1472
Channel and T Passes.....	1473
Amalgamated Wage Scale Conferences.....	1473
New York Harbor Steel Works.....	1474
Coke Production Statistics.....	1474
The New Attitude on Iron Ore.....	1475
Against Instalment Buying.....	1475
Textile Machinery Association Suggested.....	1475
Copper Production for May.....	1476
Imports More—Exports Less.....	1476
Pittsburgh Foundrymen's Association.....	1477
The Iron and Metal Markets.....	1478
A Shipment of Record Size Gate Valves.....	1491
Southern Aluminum Company.....	1491
Philadelphia Foundrymen's Association.....	1492
Proposed Oklahoma-Texas Oil-Pipe Line.....	1492
A New Ingot Mold Foundry at Josephine, Pa.....	1492
Plant Railroad Case to Be Tested.....	1493
Non-Babbittted Bronze Bearings.....	1494
Displacement of Good Machinery.....	1494
Steel Corporation Orders 278,900 Tons Less.....	1494
Concrete and Steel Bond Tests.....	1494
Obituary.....	1495
Personal.....	1495
Pittsburgh and Nearby Districts.....	1496
Michigan Charcoal Furnaces.....	1496
The Machinery Markets.....	1497
Trade Publications.....	1504
Judicial Decisions.....	1504

Under the circumstances it is not surprising that the majority members of the Senate and House are making very few calls upon the Department of Commerce for compilations of statistics to be used in the coming Congressional campaign. W. L. C.

Pittsburgh Foundrymen's Association

The annual meeting of the Pittsburgh Foundrymen's Association was held in the Fort Pitt Hotel on Monday evening, June 8. Election of officers resulted as follows: H. J. Koch, Fort Pitt Steel Casting Company, president; George B. Koch, Pennsylvania Railroad, Altoona, Pa., vice-president; W. J. Brant, treasurer; F. H. Zimmers, Union Foundry & Machine Company, secretary. An executive committee was elected as follows: H. W. Petty, American Steel Foundries; J. Uhler, Union Steel Casting Company; C. H. Gale, Pressed Steel Car Company; Bayard Phillips, Phillips-McClaren Company, and W. R. McCord. F. H. Zimmers has served as secretary since the association was organized in September, 1896. It is in a prosperous condition, having 135 members and a good balance in the treasury.

The Iron and Metal Markets

A TURN FOR THE BETTER

Larger Buying in Several Finished Lines

Increasing Expectation of a June Movement — Pig Iron and Billets Lower

Encouragement has come to the steel trade from several directions in the past week. There have been orders for 10,700 cars, bringing more than 100,000 tons of plates and shapes to Pittsburgh and Chicago mills; more pipe line business than in any week in months, and a good increase in bar buying and inquiry from implement manufacturers. These and other developments are back of the belief now expressed that the expected turn has come and that June will show a gain in unfilled orders after three months of steady and large declines.

The Steel Corporation's statement as of May 31, published June 10, shows a total of 3,998,160 tons on the books, a falling off of 278,908 tons in the month, as against 376,756 tons in April and 372,615 tons in March. The decrease is less than was predicted, but the explanation of lighter shipments than in April is not strongly reassuring.

The wrought pipe trade has been keenly following up the Valley Pipe Line Company's oil line project in California, and under the sharpest competition a Youngstown company has taken the contract for 118 miles of 8-in. and 57 miles of 10-in. pipe, a total of 15,000 tons. The Ohio Fuel Supply Company has bought 40 miles of 16-in. pipe and the Logan Natural Gas Company seven miles each of 12-in. and 16-in. pipe for the Mansfield, Ohio, district. Other oil and gas line projects have been actively in the market of late, making the outlook better than in many months.

The largest foreign pipe line inquiry ever brought to this country is now up, representing 450 miles for Persia. Germany may get a good part of this business, but the larger sizes are likely to come to this country, the leading producer here having taken a large order for the same line last year.

The New York Central's purchases of 4300 box cars and coal cars for the Big Four represents some rather unusual financing, and the orders were long delayed. The Illinois Central's 3000 cars and 400 for the Havana Central bring the total up to 10,700. Tempting offers from car companies are likely to bring further contracts before the month is out. The Pennsylvania rail order, while already distributed on paper, is still held back.

The East, with 9000 tons closed, makes the best showing in a generally dull week in structural orders. Apart from subway contracts about 30,000 tons of Eastern work is definitely in sight.

Current buying of bars is for the third quarter and second half and implement companies have shown more interest than in many months. For early shipment quite a little has been done in bars at 1.10c., but the mills are not selling on that basis into 1915. Not only in bars, but in several important lines, some consumers have tried to buy six to nine months ahead at the low point of the past month, but the mills have not been keen for such contracts.

Sheet mills have done quite a large business for third quarter at the lowest prices of the year, con-

siderable sales of galvanized being on a 2.75c. basis for No. 28.

Billets and sheet bars have yielded under the pressure of the large new open-hearth capacity finished in the past year, and \$19.50, Pittsburgh, for billets is now the market.

Southern pig iron sales since June 1 have totaled fully 175,000 tons, pipe iron running considerably over 100,000 tons. Buying by the general foundry trade has increased at prices ranging from \$10.25 to \$10.50, Birmingham, for No. 2. In the Chicago district several large buyers of foundry and malleable grades have been in the market. In most of these transactions, including lots of 3000, 4000 and 7500 tons, prices suffered. Northern foundry iron sold below \$13.50 at furnace for No. 2 and malleable under \$13.75. However, relatively better prices were realized than in the recent movement in basic in that district.

The Buffalo market was more active than in many weeks, a 10,000-ton sale of basic being the largest in a total of 25,000 tons. Concessions from the \$13 Buffalo basis for foundry iron have been made in the way of higher silicones.

Eastern buying of Alabama pipe iron has brought out a range of \$9.25 to \$9.50, Birmingham, for forge, and a low price was made on a sale of 10,000 tons of basic for water delivery in Connecticut.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

	At date, one week, one month, and one year previous	June 10, June 3, May 13, June 11.
Pig Iron. Per Gross Ton:	1914. 1914. 1914. 1913.	
No. 2 X, Philadelphia.	\$14.75 <i>\$14.75</i> \$14.75 \$16.25	
No. 2, Valley furnace.	13.00 13.00 13.00 14.00	
No. 2 Southern, Cin'ti.	13.75 13.75 13.75 14.25	
No. 2, Birmingham, Ala.	10.50 10.50 10.50 11.00	
No. 2, furnace, Chicago*	13.50 14.00 14.00 16.00	
Basic, del'd, eastern Pa.	14.00 14.00 14.00 16.00	
Basic, Valley furnace.	13.00 13.00 13.00 14.50	
Bessemer, Pittsburgh.	14.90 14.90 14.90 17.25	
Malleable Besa, Ch'go*.	13.75 14.00 14.00 16.00	
Gray forge, Pittsburgh.	13.65 13.65 13.65 14.65	
L. S. charcoal, Chicago.	15.75 15.75 15.75 16.75	
Billets, etc. Per Gross Ton:		
Bess. billets, Pittsburgh.	19.50 20.00 20.00 26.50	
O-h. billets, Pittsburgh.	19.50 20.00 20.00 26.50	
O-h. sheet bars, P'gh.	20.50 21.00 21.00 27.00	
Forging billets, base, P'gh.	25.00 25.00 25.00 34.00	
O-h. billets, Phila.	22.40 22.40 22.40 28.00	
Wire rods, Pittsburgh.	24.50 24.50 26.00 30.00	

Old Material. Per Gross Ton:				
Iron rails, Chicago.	12.75	12.75	12.75	15.25
Iron rails, Philadelphia.	15.00	15.00	15.50	17.50
Carwheels, Chicago.	11.50	11.50	11.50	13.50
Carwheels, Philadelphia.	11.25	11.25	11.75	13.00
Heavy steel scrap, P'gh.	11.50	11.50	11.50	12.50
Heavy steel scrap, Phila.	10.50	10.50	10.50	12.00
Heavy steel scrap, Ch'go.	9.75	9.50	9.75	10.00
No. 1 cast, Pittsburgh.	11.50	11.50	11.50	12.75
No. 1 cast, Philadelphia.	12.00	12.00	12.50	13.25
No. 1 cast, Ch'go (net ton)	9.75	9.75	10.00	10.75

Finished Iron and Steel.	Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bess. rails, heavy, at mill		1.25	1.25	1.25	1.25
Iron bars, Philadelphia.	1.77	1.20	1.20	1.57 ^{1/2}	
Iron bars, Pittsburgh.	1.25	1.25	1.30	1.65	
Iron bars, Chicago.	1.10	1.10	1.10	1.58	
Steel bars, Pittsburgh.	1.12 ^{1/2}	1.12 ^{1/2}	1.13	1.40	
Steel bars, New York.	1.28 ^{1/2}	1.28 ^{1/2}	1.31	1.56	
Tank plates, Pittsburgh.	1.10	1.10	1.15	1.45	
Tank plates, New York.	1.26	1.26	1.31	1.61	
Beams, etc., Pittsburgh.	1.12 ^{1/2}	1.12 ^{1/2}	1.15	1.45	
Beams, etc., New York.	1.28 ^{1/2}	1.28 ^{1/2}	1.31	1.81	
Skelp, grooved steel, P'gh	1.15	1.20	1.20	1.45	
Skelp, sheared steel, P'gh	1.20	1.25	1.25	1.50	
Steel hoops, Pittsburgh.	1.25	1.25	1.25	1.60	

Sheets, Nails and Wire.	Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh	1.60	1.85	1.85	2.20	
Galv. sheets, No. 28, P'gh	2.75	2.75	2.80	3.40	
Wire nails, Pittsburgh.	1.50	1.50	1.55	1.80	
Cut nails, Pittsburgh.	1.55	1.55	1.60	1.70	
Fence wire, base, P'gh.	1.30	1.30	1.35	1.60	
Barb wire, galv., P'gh.	1.90	1.90	1.95	2.20	

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Coke, Connellsville,

	June 10,	June 3,	May 13,	June 11,
Per Net Ton at Oven:	1914.	1914.	1914.	1913.
Furnace coke, prompt...	\$1.75	\$1.75	\$1.75	\$2.15
Furnace coke, future...	1.85	1.90	2.00	2.25
Foundry coke, prompt...	2.30	2.40	2.40	2.85
Foundry coke, future...	2.50	2.50	2.50	3.00

Metals.

Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.	14.12 1/2	14.25	14.37 1/2	15.75
Electrolytic copper, N. Y.	13.87 1/2	14.00	14.12 1/2	15.25
Spelter, St. Louis.	4.95	4.95	5.00	5.00
Spelter, New York.	5.10	5.10	5.15	5.15
Lead, St. Louis.	3.80	3.80	3.80	4.20
Lead, New York.	3.90	3.90	3.90	4.35
Tin, New York.	30.65	30.45	33.70	45.00
Antimony, Hallett's, N. Y.	6.87 1/2	6.87 1/2	6.85	8.20
Tin plate, 100-lb. box, P'g'h	\$3.30	\$3.30	\$3.30	\$3.60

Finished Iron and Steel f. o. b. Pittsburgh

Freight rates from Pittsburgh, in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Louis, 22 1/2c.; Kansas City, 42 1/2c.; Omaha, 42 1/2c.; St. Paul, 32c.; Denver, 84 1/2c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, 1/4 in. thick, 6 1/4 in. up to 100 in. wide, 1.10c. to 1.15c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers with extras:

Rectangular plates, tank steel or conforming to manufacturer's standard specifications for structural steel dated February 6, 1903, or equivalent, 1/4 in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered 1/4-in. plates. Plates over 72 in. wide must be ordered 1/4 in. thick on edge, or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras	Cents per lb.
Gauges under 1/4 in. to and including 3-16 in.	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including straight taper plates), 3 ft. and over	.10
Complete circles 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths, under 3 ft., to 2 ft. inclusive	.25
Cutting to lengths, under 2 ft., to 1 ft. inclusive	.50
Cutting to lengths, under 1 ft.	.55
No charge for cutting rectangular plates to lengths 3 ft. and over.	

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, 1/4 in. thick and over, and zees, 3 in. and over, 1.12 1/2c. to 1.15c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in. on one or both legs	.10
Angles, 3 in. on one or both legs, less than 1/4 in. thick, as per steel bar card, Sept. 1, 1909.	.70
Tees, structural sizes (except elevator, hand rail, car truck and conductor rail)	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909.	.20 to .80
Deck beams and bulb angles	.30
Hand rail tees	.75
Cutting to lengths, under 3 ft. to 2 ft. inclusive	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive	.50
Cutting to lengths, under 1 ft.	.55
No charge for cutting to lengths 3 ft. and over.	

Wire Products.—Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent. discount in 10 days, carload lots to jobbers, annealed, \$1.30 to \$1.35; galvanized, \$1.70 to \$1.75. Galvanized barb wire and fence staples to jobbers, \$1.90 to \$1.95; painted, \$1.50 to \$1.55. Wire nails to jobbers, \$1.50 to \$1.55. Woven wire fencing, 73 1/2 per cent. off list for carloads; 72 1/2 off for 1000-rod lots; 71 1/2 off for less than 1000-rod lots.

The following table gives the price to retail mer-

chants on fence wire in less than carloads, with the extras added to the base price:

Plain Wire, per 100 lb.									
Nos.	0 to 9	10	11	12 & 12 1/2	13	14	15	16	
Annealed	\$1.50	\$1.55	\$1.60	\$1.65	\$1.75	\$1.85	\$1.95	\$2.05	
Galvanized	1.95	1.95	2.00	2.05	2.15	2.25	2.65	2.75	

Wire Rods.—Bessemer, open-hearth and chain rods, \$24.50 to \$25.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on steel pipe in effect from April 20, 1914, and iron pipe from June 2, 1913, all full weight:

Butt Weld					Iron		
Inches	Black	Galv.	Inches	Black	Galv.		
1/8, 1/4 and 3/8	.73	52 1/2	1/4 and 3/4	.66	47		
1/2	.77	66 1/2	1/2	.65	46		
5/8 to 3	.80	71 1/2	5/8	.69	56		
			3/4 to 2 1/2	.72	61		

Lap Weld					Iron		
Inches	Black	Galv.	Inches	Black	Galv.		
2	.77	68 1/2	1 1/2	.56	45		
2 1/2 to 6	.79	70 1/2	1 1/2	.67	56		
7 to 12	.76	65 1/2	2	.68	58		
13 to 15	.53	71 1/2	2 1/2 to 4	.70	61		
			4 1/2 to 6	.70	61		
			7 to 12	.68	55		

Reamed and Drifted					Iron		
Inches	Black	Galv.	Inches	Black	Galv.		
1 to 3, butt	.78	69 1/2	1 1/2	.70	59		
2, lap	.75	66 1/2	2, butt	.70	59		
2 1/2 to 6, lap	.77	68 1/2	1 1/4, lap	.54	43		
			1 1/4, lap	.65	54		
			2, lap	.66	56		
			2 1/2 to 4, lap	.68	59		

Butt Weld, extra strong, plain ends					Iron		
Inches	Black	Galv.	Inches	Black	Galv.		
1/8, 1/4 and 3/8	.68	57 1/2	3/8	.63	52		
1/2	.73	66 1/2	1/2	.67	60		
3/4 to 1 1/2	.77	70 1/2	3/4 to 1 1/2	.71	62		
2 to 3	.78	71 1/2	2 and 2 1/2	.72	63		

Lap Weld, extra strong, plain ends					Iron		
Inches	Black	Galv.	Inches	Black	Galv.		
2	.74	65 1/2	1 1/2	.65	59		
2 1/2 to 4	.76	67 1/2	2	.66	58		
4 1/2 to 6	.75	66 1/2	2 1/2 to 4	.70	61		
7 to 8	.68	57 1/2	4 1/2 to 6	.69	60		
9 to 12	.63	52 1/2	7 to 8	.63	53		
			9 to 12	.58	47		

To the large jobbing trade an additional 5 and 2 1/2 per cent. is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Boiler Tubes.—Discounts to jobbers, in carloads, in effect from May 1, 1914, on steel and from January 2, 1914, on iron, are as follows:

Lap Welded Steel		Standard Charcoal Iron		
1 1/8 and 2 in.	.62	1 1/2 in.	.45	
2 1/4 in.	.59	1 1/8 and 2 in.	.49	
2 1/2 to 2 3/4 in.	.65	2 1/4 in.	.45	
3 and 3 1/4 in.	.70	2 1/2 to 2 3/4 in.	.54	
3 1/2 to 4 1/2 in.	.72	3 and 3 1/4 in.	.57	
5 and 6 in.	.65	3 1/2 to 4 1/2 in.	.60	
7 to 13 in.	.62	5 and 6 in.	.49	

Locomotive and steamship special charcoal grades bring higher prices.

2 1/2 in. and smaller, over 18 ft., 10 per cent. net extra.

2 1/2 in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft., and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points.

Sheets.—Makers' prices for mill shipment on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms 30 days net or 2 per cent. cash discount in 10 days from date of invoice:

Blue Annealed Sheets		Cents per lb.		
Nos. 3 to 8			1.30	
Nos. 9 to 10			1.35	
Nos. 11 and 12			1.40	
Nos. 13 and 14			1.45	
Nos. 15 and 16			1.55	

Box Annealed Sheets, Cold Rolled		Cents per lb.		
Nos. 10 and 11			1.45 to 1.50	
No. 12			1.45 to 1.50	
Nos. 13 and 14			1.50 to 1.55	
Nos. 15 and 16			1.55 to 1.60	
Nos. 17 to 21				

Galvanized Sheets of Black Sheet Gauge

	Cents per lb.
Nos. 10 and 11	1.75 to 1.80
No. 12	1.85 to 1.90
Nos. 13 and 14	1.85 to 1.90
Nos. 15 and 16	2.00 to 2.05
Nos. 17 to 21	2.15 to 2.20
Nos. 22 and 24	2.30 to 2.35
Nos. 25 and 26	2.45 to 2.50
No. 27	2.50 to 2.65
No. 28	2.75 to 2.80
No. 29	2.90 to 2.95
No. 30	3.05 to 3.10

Pittsburgh

PITTSBURGH, PA., June 9, 1914.

It looks as though the expected increase in new buying of iron and steel products in June will be realized. Orders for about 11,000 new cars placed in the past week and others in prospect are encouraging, as is also the fact that some large pipe lines have been placed, which will serve to give the pipe mills more work than they have had for some time. The feeling in the whole trade is better, and it is believed the worst of the depression in the steel trade has been seen and that prices have reached the low point. Some contracting for steel bars has been done for third quarter and last half delivery and also for black and galvanized for third quarter. Consumers are showing more interest in the market and believe it is a good time to load up as far ahead as the mills will sell. However, the mills are holding off taking contracts for long delivery as much as possible, and as a rule will sell only through third quarter at today's prices. The new inquiry for pig iron is better, but consumers are still buying for actual needs. Prices on pig iron are holding up well, considering the light demand there has been all this year. Specifications for sheet bars are better and there are indications of buying of scrap by one or two local consumers that have been out of the market for months. Some figuring is being done on blast-furnace coke for last half, but makers and sellers are slow in getting together on prices. It will be a distinct disappointment if orders booked by the mills in June do not show a material increase over any month since last February. Little talk is being heard of reductions in wages, and these may not be made in view of the better feeling in the trade.

Pig Iron.—More inquiry is appearing in the local market for basic and foundry iron. A Wheeling district company is asking prices on 3000 to 4000 tons of basic. The American Steel Foundries, which has been in the market for some time for about 10,000 tons of basic iron, has not closed, not being able to get a satisfactory price. We note two sales of 1000 tons of each of No. 2 foundry iron at \$13, 300 tons of basic at \$13, and 200 tons of Bessemer at \$14, all at Valley furnace. We quote: Bessemer iron, nominally, \$14; basic, \$13; No. 2 foundry, \$13 to \$13.50; gray forge, \$12.75, and malleable Bessemer, \$13 to \$13.25, all at Valley furnace, the freight to Pittsburgh and Cleveland being 90c. a ton.

Billets and Sheet Bars.—Official advices are that steel mills in the Pittsburgh district and in the Mahoning Valley are running at about 65 per cent. of capacity. A leading steel mill reports that so far in June its specifications for billets and sheet bars have been better than in May. The cost of making steel is higher now than in 1911, when steel sold at low prices, but there has been a heavy increase in capacity, and 65 per cent. operations means a much larger output to-day than two or three years ago. Prices are slightly weaker, mills being keen for the small amount of new business that is coming out. We quote Bessemer and open-hearth billets at \$19.50 to \$20, and Bessemer and open-hearth sheet bars at \$20.50 to \$21, f.o.b. makers' mill, Pittsburgh or Youngstown. We quote forging billets at \$25 for desirable orders of one size and up to but not including 10 x 10 in., regular extras being charged for larger sizes. On carload orders forging billets are held at \$25. We quote axle billets at \$23 for desirable orders and \$24 for small lots, f.o.b. Pittsburgh.

Ferroalloys.—New inquiry is light, but some resales of ferromanganese are being made by consumers who have overbought, at less than \$38, Baltimore. We note sales of two carloads, or about 60 tons, at \$37.50, Baltimore. Prices on ferrosilicon are firm, but new sales are

carload lots only. We quote 50 per cent. ferrosilicon, in lots up to 100 tons, at \$73; over 100 tons to 600 tons, \$72; over 600 tons, \$71, delivered in the Pittsburgh district. On 10 per cent. ferrosilicon the quotation is \$19; 11 per cent., \$20, and 12 per cent., \$21, f.o.b. cars Jackson County, Ohio, or Ashland, Ky., furnace. We quote 20 per cent. spiegeleisen at \$25 at furnace. We quote ferrotitanium at 8c. per lb. in carloads; 10c. in 2000-lb. lots and over, and 12½c. in less than 2000-lb. lots.

Muck Bar.—In the absence of sales we quote best grades of muck bar, made from all pig iron, at nominally \$27, Pittsburgh.

Structural Material.—Inquiry is not heavy. The McClintic-Marshall Company has taken a highway bridge at Bethlehem, Pa., 1500 tons, the new building to be erected in this city for the Ford Motor Company of Detroit, 1500 tons, and 300 tons for an extension to the plant of the J. S. Mundy Company, Newark, N. J. Local fabricators are bidding on 2500 tons of steel and reinforcing bars for a new warehouse for the William Birmingham Company, Cleveland. We quote beams and channels up to 15 in. at 1.12½c. to 1.15c., f.o.b. Pittsburgh, but in exceptional cases, and for very desirable orders 1.10c. has been done.

Plates.—Some good-sized car orders have been placed in the past week, and it is said others will be given out soon. The New York Central has ordered 4300 box cars from the American Car & Foundry Company and 3000 steel coal cars from the Standard Steel Car Company, these cars being largely for the Big Four, a line controlled by the New York Central. The Illinois Central has bought 3000 box cars, 1000 going to the Western Steel Car & Foundry Company, 1000 to the American Car & Foundry Company and 500 each to the Standard Steel Car Company and the Haskell & Barker Car Company. The Jones & Laughlin Steel Company has taken about 500 tons of plates for oil barges to be built by the United States Government. The cars just bought will take over 100,000 tons of plates and shapes, and these will go to Chicago and Pittsburgh mills, taking up that much slack that has heretofore existed. The plate mills continue to run to only about 50 per cent. of capacity. We quote ¼-in. and heavier plates at 1.10c. to 1.15c., f.o.b. Pittsburgh.

Steel Rails.—The Carnegie Steel Company has received some fair-sized orders for standard sections and light rails for export to Chile, Australia and the Orient. New orders for standard sections for domestic roads are mostly small lots. The Pennsylvania Railroad order is expected to be placed this week. The Carnegie Company received new orders and specifications in the past week for about 2250 tons of light rails. We quote light rails rolled from billets as follows: 25, 30, 35, 40 and 45 lb. sections, 1.10c.; 16 and 20 lb., 1.15c.; 12 and 14 lb., 1.20c., and 8 and 10 lb., 1.25c., in carload lots, f.o.b. Pittsburgh. For large lots these prices might be shaded.

Steel Wheels.—It is said that on the 10,300 cars ordered by the New York Central and Illinois Central railroads cast-iron wheels will be used entirely, the initial cost of steel wheels being regarded as too high. We quote 33-in. engine truck wheels at \$21; 36-in. engine truck wheels, \$22; 33-in. tender wheels, \$17; 36-in. passenger and tender wheels, \$19 to \$19.50; 33-in. freight car wheels, \$14.50 to \$15, f.o.b. Pittsburgh.

Skelp.—The low prices ruling on billets are reflected in skelp, which is weaker. New orders placed for some time have been very light, as pipe mills have not been running to more than 50 per cent. We have reduced our quotations \$1 a ton and now quote grooved steel skelp at 1.15c. to 1.20c.; sheared steel skelp, 1.20c. to 1.25c.; grooved iron skelp, 1.50c. to 1.55c.; sheared iron skelp, 1.60c. to 1.65c., delivered to consumers' mills in the Pittsburgh district.

Wire Rods.—Some business for third quarter and last half of the year delivery in rods has been placed by consumers whose contracts expire July 1. Specifications against contracts have not been active for some months, and most consumers still have a good deal of tonnage due them, which should have been taken out. We quote Bessemer, open-hearth and chain rods at \$24.50 to \$25, f.o.b. mill, Pittsburgh.

Cotton Ties.—The Carnegie Steel Company is the only maker in this district that is rolling cotton ties this year, but it has not as yet named its prices. The chances are that cotton ties will sell at lower prices this year than for a long time, due to the general depression and to the keen competition for domestic business from foreign mills.

Iron and Steel Bars.—Mill advices are that some contracts for steel bars have been taken from the implement makers for third and fourth quarter delivery of this year, but the tonnage involved is much less than usual. Some of the steel-bar makers strongly maintain that they will not sell steel bars for delivery into 1915 at present low prices. A few very desirable contracts have been made at 1.10c. for third-quarter delivery, but these are exceptional. We quote steel bars at 1.12½c. to 1.15c. on current orders. The new demand for steel bars for reinforcing work continues heavy, but there is little doing in common iron bars, and all the mills are badly in need of orders. We quote steel bars at 1.12½c. to 1.15c., and common iron bars, in which very little scrap is used, at 1.25c. to 1.30c., f.o.b. makers' mill, Pittsburgh. Regular extras for twisting reinforcing steel bars over the base price are as follows: ¾-in. and over, \$1; ½ to 11/16-in., \$1.50; under ½-in., \$2.50 per net ton. These extras are not always observed.

Sheets.—The new demand and also specifications against contracts for black and galvanized sheets are better. Jobbers and consumers realize that prices on sheets are extremely low, and they are now anxious to cover their needs as far ahead as the mills will sell. Some contracts for third-quarter delivery have been taken at 1.80c. for No. 28 Bessemer black sheets and about 2.75c. for No. 28 galvanized. Two or three leading makers state they will not sell for delivery beyond 60 days. On blue annealed sheets 1.30c. has been done on Nos. 9 and 10 in a few cases. We quote Nos. 9 and 10 blue annealed sheets at 1.35c.; No. 28 Bessemer black, 1.80c. to 1.85c.; No. 28 galvanized, 2.75c. to 2.80c.; No. 28 black plate, tin mill sizes, H. R. and A., 1.85c.; Nos. 29 and 30, 1.90c. The above prices are in carload lots, f.o.b. Pittsburgh, jobbers charging the usual advances for small lots from store.

Tin Plate.—One leading maker states that last week was the best in specifications it has had in some time, but two or three others report a slight falling off and are running at a lower rate of operations. There is not much new buying, as consumers are well covered for their needs for this year. On small lots of tin plate now selling we quote 100-lb. 14 x 20 coke plates, \$3.30 to \$3.40, and 100-lb. 14 x 20 terne plates, \$3.20 to \$3.30.

Shafting.—Several makers state that specifications for shafting from the automobile and implement trades are a little better, but new demand is still dull and not more than 30 to 35 per cent. of capacity. We quote cold-rolled shafting in carload and larger lots at 65 to 66 per cent. off, and on very attractive orders 67 per cent. is being done. This figures back to a base price of 1.65c. per lb. on cold-rolled shafting, which is certainly very low. We quote small lots at 63 to 64 per cent. off, delivered in base territory.

Spikes.—It is stated that the inquiry of the Seaboard Air Line for 6000 kegs has not yet been placed. The new demand for railroad spikes is only for small lots, and railroads are not specifying freely against contracts. None of the spike makers is running to more than 50 per cent. of capacity. We quote standard sizes of railroad spikes at \$1.40, and small railroad and boat spikes at \$1.50 per 100 lb. in carload and larger lots, f.o.b. Pittsburgh.

Merchant Steel.—Several makers state that new orders for seasonable steels this month are better than in the same time in May, and specifications against contracts are coming in a little more freely. On desirable orders prices are being freely shaded, but on small lots are about as follows: Iron finished tire, ½ x 1½ in. and larger, 1.30c., base; under ½ x 1½ in., 1.45c.; planished tire, 1.50c.; channel tire, ¾ to 7/8 and 1 in., 1.80c. to 1.90c.; 1½ in. and larger, 1.90c.; toe calk, 1.90c. to 2c., base; flat sleigh shoe, 1.65c.; concave and convex, 1.70c.; cutter shoe, tapered or bent, 2.20c. to 2.30c.; spring steel, 1.90c. to 2c.; machinery

steel, smooth finish, 1.70c. We quote cold-rolled strip steel as follows: Base rates for 1 in. and 1½ in. and wider, under 0.20 carbon, and No. 10 and heavier, hard temper, 3.25c.; soft, 3.50c.; coils, hard, 3.15c.; soft, 3.40c.; freight allowed. The usual differentials apply for lighter sizes.

Wire Products.—The new demand for wire and wire nails is for small lots to meet current needs. Specifications against contracts are only fair. The wire trade is likely to be quiet over the next several months, or until the fall demand starts up. We quote wire nails, \$1.50 to \$1.55; plain annealed wire, \$1.30 to \$1.35; galvanized barb wire and fence staples, \$1.90 to \$1.95; painted barb wire, \$1.50 to \$1.55, all f.o.b. Pittsburgh, actual freight added to point of delivery, terms 30 days net, less 2 per cent. off for cash in 10 days. We quote steel cut nails at \$1.55 to \$1.60, f.o.b. Pittsburgh.

Hoops and Bands.—Some contracts for bands have been placed for delivery in third quarter on the basis of about 1.12½c., maker's mill. A larger demand for steel hoops is expected in August or September, as the distillers usually place contracts about that time. We quote steel bands at 1.12½c. to 1.15c., with extras as per the steel bar card, and steel hoops at 1.25c., f.o.b. Pittsburgh.

Rivets, Nuts and Bolts.—Makers of nuts and bolts state that the new demand is very dull, none of them running to more than 35 to 40 per cent. of capacity, and some at a less rate. The new demand for boiler rivets is light, but for structural rivets is reported by one or two makers to be slightly better. We quote buttonhead structural rivets in carloads at 1.55c. and in small lots 1.60c. to 1.65c.; conehead boiler rivets at 1.65c. in carload lots, and 1.70c. to 1.75c. in small lots, with terms 30 days net, less 2 per cent. for cash in 10 days. Discounts on nuts and bolts are as follows in lots of 300 lb. or over, delivered within a 20c. freight radius of maker's works:

Coach and lag screws	80 and 5% off
Small carriage bolts, cut threads	80% off
Large carriage bolts	75 and 5% off
Small machine bolts, cut threads	80 and 5% off
Small machine bolts, rolled threads	80 and 10% off
Large machine bolts	75 and 10% off
Machine bolts, c.p.c. & t nuts, small	80% off
Machine bolts, c.p.c. & t nuts, large	75 and 5% off
Square h.p. nuts, blanked and tapped	\$6.30 off list
Hexagon nuts	\$7.20 off list
C.p.c. and r sq. nuts, blanked and tapped	\$6.60 off list
Hexagon nuts, ¾ and larger	\$7.20 off list
Hexagon nuts, smaller than ½ in.	\$7.80 off list
C.P. plain square nuts	\$5.50 off list
C.P. plain hexagon nuts	\$5.90 off list
Semi-fin. hex. nuts, ½ in. and smaller	85, 10 & 10% off
Semi-fin. hex. nuts, ¾ in. and larger	85 & 5% off
Rivets, 7/16 x 6½, smaller & shorter	\$8, 10 & 5% off
Rivets, tin plated, packages	80, 10 and 5% off
Rivets, metallic tinned, packages	80, 10 and 5% off
Standard cap screws	70, 10 and 10% off
Standard set-screws	75, 10 and 10% off

Boiler Tubes.—Mills report a little better demand for locomotive tubes, but for merchant tubes it is still very dull. Discounts are being better observed than for some time, but are still being shaded.

Standard Pipe.—The local pipe trade is much interested over a foreign inquiry for pipe, said to be the largest that has ever come in this market. It is for about 450 miles and embraces 150 miles of 4-in., 100 miles of 6-in., 40 miles of 7-in., 30 miles of 8-in., 50 miles of 10-in., 20 miles of 12-in., and considerable pipe of other sizes. It is hardly expected that the entire order will come to this country, as the German mills could furnish all this pipe up to the 10-in., but for the larger sizes the prospective buyer would probably have to look to the American mills. The entire order is for delivery this year, but may run into next year, and competition for this business between American and German mills will likely be very keen. More orders for line pipe were placed the past week than for some time. The Ohio Fuel Supply Company placed 40 miles of 16-in. steel pipe with Spang, Chalfant & Co. The Dayton Pipe Coupling Company, of which D. O. Holbrook is Pittsburgh sales manager, will furnish the couplings for this line. The Logan Natural Gas Company has placed 7 miles of 12-in. and 7 miles

of 16-in. for delivery in the Mansfield (Ohio) district. The Valley Pipe Line Company, of California, has placed an order with the Youngstown Sheet & Tube Company for 118 miles of 8-in. and 57 miles of 10-in. oil line pipe, the order amounting to about 15,000 tons. Some other fairly large projects have also come up and indications for a heavy demand for line pipe for the next four or five months are good. Several mills report the new demand for merchant pipe so far in June as heavier than in May. The general outlook for the pipe trade is therefore better. Discounts on both iron and steel pipe are being very well maintained, but on line pipe prices are being cut more or less.

Coke.—Blast furnaces whose contracts for coke expire June 30 do not seem to be in a hurry to cover for last half, and several furnacemen have said that unless they can get \$1.75 for last half they will not contract, but will buy from month to month. Three or four fairly large inquiries for furnace coke are out. Standard makes of furnace coke for prompt shipment are easily obtainable at \$1.75, but on contracts for last half \$1.85 is quoted by some makers, while two or three interests, whose coke has a high reputation in the trade, are holding out for \$2. There is some inquiry for foundry coke for last half from consumers whose contracts expire on July 1. We quote standard makes of furnace coke for prompt shipment at \$1.75, and for delivery over last half at \$1.85 to \$2 per net ton at oven; standard makes of 72-hr. foundry coke to consumers, \$2.30 to \$2.40 per net ton at oven. The Connellsville Courier reports the output of coke in the upper and lower Connellsville regions for the week ended May 30 at 244,028 net tons, a decrease over the previous week of 11,260 tons. This is the lowest rate of output in these regions for many months.

Old Material.—The local market is in a peculiar condition. Dealers state that they cannot sell scrap except at very low prices, and yet when they sell it is hard to pick up the material and come out even on it. The steel mills have been running very light for some time, making much less than the usual output of scrap and it is scarce. The heavy steel scrap in the Pennsylvania Railroad list is reported to have gone direct to consumers at slightly over \$12, Pittsburgh. A local consumer who has been out of the market for some time is now reported as willing to take in moderate lots at its price. There is still a scarcity of borings, which are firm at \$8.25 to \$8.50, delivered to consumers' mills. A sale of 250 tons of borings is reported at \$8.25, delivered. Dealers quote, per gross ton, for delivery to consumers' mills in the Pittsburgh and nearby districts that take the same rates of freight as follows:

Selected heavy steel melting scrap,			
Steubenville, Follansbee, Bracken-			
ridge, Sharon, Monessen, Midland			
and Pittsburgh delivery	\$12.00 to \$12.25		
Ordinary steel melting scrap	11.50 to 11.75		
Compressed side and end sheet scrap	11.00 to 11.25		
No. 1 foundry cast	11.50 to 11.75		
No. 2 foundry cast	10.25 to 10.50		
Bundled sheet scrap, f.o.b. consumers'			
mills, Pittsburgh district	8.50 to 8.75		
Rerolling rails, Newark and Cam-			
bridge, Ohio, Cumberland, Md., and			
Franklin, Pa.	12.75 to 13.00		
No. 1 railroad malleable stock	11.00 to 11.25		
Railroad grate bars	10.25 to 10.50		
Low phosphorus melting stock	14.25 to 14.50		
Iron car axles	22.50 to 23.00		
Steel car axles	15.50 to 16.00		
Locomotive axles, steel	20.00 to 20.50		
No. 1 busheling scrap	10.25 to 10.50		
No. 2 busheling scrap	7.25 to 7.50		
Machine shop turnings	7.75 to 8.00		
Old carwheels	11.25 to 11.50		
Cast-iron borings	8.00 to 8.25		
Sheet bar crop ends	12.00 to 12.25		
Old iron rails	13.75 to 14.00		
No. 1 railroad wrought scrap	11.50 to 11.75		
Heavy steel axle turnings	8.50 to 8.75		
Heavy breakable cast scrap	12.00 to 12.25		

†Shipping point.

C. Tennant Sons & Co., 100 William street, New York, have been appointed by La Societe des Etablissements Keller-Leleux, Paris, one of the most important European makers, sole agents in the United States for the sale of silico-spiegel consisting of 20 to 25 per cent. of silicon and 48 to 68 per cent. of manganese or higher.

Chicago

CHICAGO, ILL., June 10, 1914.—(By Wm.)

Pig-iron sales last week were very interesting. Leading manufacturers of the West having regular lines of work have been closing for last-half iron on a conservative scale. The sales of the past 30 days have been of such tonnage and character as to save the market for all grades of iron from breaking down to the level established for basic a few weeks ago. Interest in last-half purchases is not yet satisfied and a very general inquiry is noted. Encouragement for the steel mills has not assumed such tangible form. The buying of over 10,000 cars last week was helpful but insufficient to be of permanent consequence. The settlement of the brickmakers' strike in this city released some structural tonnage and removed a disturbing element from the situation. Developments in the Union Depot project promise something in this connection for early fall but nothing which may be considered a ground for a real enlargement of business has appeared. The time is not yet here when the producers are willing to urge upon their favored customers the desirability of buying at once. Little attention is being given to future delivery contracts for steel but the mills are extending themselves in the pursuit of specifications to fill in on current rolling schedules. Prices for immediate shipment orders are accordingly at the lowest level, the very ordinary business of this market in shapes and plates being transacted on a basis of 1.28c., Chicago.

Pig Iron.—Purchases of foundry and malleable iron in lots of 3000, 4000 and 7500 tons last week are important in that they represent the best judgment of this market's most desirable customers. They are also interesting as showing that foundry and malleable iron could not be purchased last week at prices as low as earlier basic sales were made. This greater assurance in the attitude of the furnaces was not so evident in the sales of foundry iron as in connection with malleable, and this distinction is in a measure indicated by our quotations. The more important sales of the week were to a car builder and a malleable foundry at St. Louis and to the leading maker of fittings at Chicago. The purchases were all of Northern iron. Southern iron in this market, despite the fact that it can be had on a basis of \$14.60 delivered at Chicago, is still too high to compete with local irons. The buying by the larger interests has been on a very conservative scale and any material increase in their business in the last half of the year will bring them into the market again. Other inquiry is quite general but for small tonnages, and melters appear in no great hurry to close. There is also a substantial inquiry for charcoal iron aggregating close to 4000 tons, which, coupled with the fact that a number of charcoal furnaces are out of blast, is contributing to a stronger situation for this kind of iron. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace and do not include a local switching charge averaging 50c. a ton:

Lake Superior charcoal	\$15.75 to \$16.75
Northern coke foundry, No. 1	14.25 to 14.75
Northern coke foundry, No. 2	13.50 to 14.00
Northern coke foundry, No. 3	13.25 to 13.50
Southern coke, No. 1 f'dry and 1 soft	15.35 to 15.85
Southern coke, No. 2 f'dry and 2 soft	14.85 to 15.35
Malleable Bessemer	13.75 to 14.25
Standard Bessemer	17.00
Basic	13.25 to 13.50
Low phosphorus	21.00 to 21.75
Jackson Co. and Ky. sil'vry, 6 per cent.	16.90 to 17.40
Jackson Co. and Ky. sil'vry, 8 per cent.	17.90 to 18.40
Jackson Co. and Ky. sil'vry, 10 per cent.	18.90 to 19.40

(By Mail)

Rails and Track Supplies.—Aside from the interest which attaches to the prospect of an early placing of rail orders by the Pennsylvania lines, there is little or nothing in this market worthy of comment regarding rails. Some small sales of bolts and spikes are noted, the business being taken at very close prices. We quote standard railroad spikes at 1.50c. to 1.55c., base; track bolts with square nuts, 2c. to 2.10c., base, all in carload lots, Chicago; tie plates, \$26 to \$28 net ton; standard section Bessemer rails, Chicago, 1.25c., base;

open hearth, 1.34c.; light rails, 25 to 45 lb., 1.25c.; 16 to 20 lb., 1.30c.; 12 lb., 1.35c.; 8 lb., 1.40c.; angle bars, 1.50c., Chicago.

Structural Material.—The ratification of the Union Depot plan leads to the statement by railroad officials that this project will be started in Chicago about September 1. The award of the general contract for the municipal pier is still very much unsettled. Building operations, which have been almost at a standstill by reason of the brickmakers' strike, are now expected to go forward, following what seems to be a permanent settlement. Contracts for fabricated steel placed during the week total about 2800 tons and were, individually, of no special significance. The American Bridge Company will furnish 440 tons for the Missouri State Life Building, St. Louis, and 452 tons for the Thompson Falls (Mont.) Power Company. Other contracts included 277 tons for the Lorimer Bridge, Piqua, Ohio, to the Hakerden Construction Company; 442 tons for a Colorado River bridge, Smithville, Tex.; 805 tons, Chicago & Western Indiana Railroad, to the Lackawanna Bridge Company; 200 tons for the Southern Railway Company, to the Wisconsin Bridge & Iron Company, and 152 tons for the Pillsbury flour mills, Minneapolis, to Williams Brothers Boiler & Mfg. Company. Despite the fact that no important tonnages of shapes are being placed, the lowest prices thus far mentioned are being reported and although 1.28c., Chicago, may be considered the market, lower quotations have been named. The placing of 7300 cars by the New York Central Lines and 3000 box cars by the Illinois Central was exceedingly welcome even though the cars for which steel will be furnished from Western mills will not require a tonnage sufficient to change the general aspects of the situation. The Illinois Central order was distributed among four Western car shops, while a part of the Big Four cars may be built at St. Louis. We quote for mill delivery of structural shapes at Chicago, 1.28c.

Local jobbers are following closely on the heels of the mills in making quotations to their customers on mill shipments and jobbers' prices of 1.28c., Chicago, for such business are noted. Settlement of the brickmakers' strike released a large tonnage of shapes for delivery from stock, making the week one of unusual activity. For material out of stock we quote 1.75c., Chicago.

Plates.—The contrast between the attitude of the mills with reference to specifications for immediate shipment and contracts for extended delivery was never more sharply drawn. To secure orders for immediate rolling, low prices are being made while the increasing number of inquiries from consumers regarding contracts for the last half and the full year from July to July are being given little or no consideration. Plate makers are now reconciled to the third quarter as a period of low-priced business but despite their willingness to book orders for that delivery at concessions, they have hardly more than enough tonnage on their books to run through the current month. For Chicago delivery from mill we quote 1.25c. to 1.28c.

For Chicago delivery of plates out of stock in small quantities we quote 1.75c.

Sheets.—It is understood that some of the sheet mills whose recent quotations have represented the most marked concessions reported in the market have booked a fairly large aggregate tonnage for third quarter shipment. A number of the jobbers have been participants in this buying. Prices have not changed appreciably and we continue to quote for Chicago delivery from mill: No. 10 blue annealed, 1.48c.; No. 28 black, 1.98c.; No. 28 galvanized, 2.93c. to 2.98c.

We quote for Chicago delivery from store as follows, minimum prices applying on bundles of 25 or more: No. 10 blue annealed, 1.95c.; No. 28 black, 2.35c. to 2.45c.; No. 28 galvanized, 3.35c. to 3.45c.

Bars.—The manner in which the placing of implement bar contracts is being delayed indicates a mutual acceptance by both sellers and buyers of the fact that no important change in the general situation is imminent. With the exception of a fair demand for reinforcing bars, new business continues very light. Tonnage in bar iron is coming out very slowly and prices are unimproved. We quote for mill shipments as follows: Bar iron, 1.10c.; soft steel bars, 1.28c. to 1.33c.; hard steel bars, 1.25c. to 1.30c.; shafting in carloads, 65 per cent. off; less than carloads, 60 per cent. off.

We quote store prices for Chicago delivery: Soft steel bars, 1.65c.; bar iron, 1.65c.; reinforcing bars, 1.65c. base, with 5c. extra for twisting in sizes $\frac{1}{2}$ in. and over and usual card extras for smaller sizes; shafting 60 per cent. off.

Rivets and Bolts.—Quotations, particularly on bolt business, are subject to decidedly wide variations and our quotations are purely nominal. In volume, recent orders for rivets are reported as showing improvement. We quote from mill as follows: Carriage bolts up to $\frac{1}{2}$ x 6 in., rolled thread, 80-5; cut thread, 80; larger sizes, 75-5; machine bolts up to $\frac{1}{2}$ x 4 in., rolled thread, 80-10; cut thread, 80-5; larger sizes, 75-10; coach screws, 80-15; hot pressed nuts, square head, \$6.20 off per cwt.; hexagon, \$7 off per cwt. Structural rivets, $\frac{1}{2}$ to $1\frac{1}{4}$ in., 1.73c. to 1.78c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

We quote out of store: Structural rivets, 2.35c.; boiler rivets, 2.55c.; machine bolts up to $\frac{1}{2}$ x 4 in., 75-10; larger sizes, 70-10-5; carriage bolts up to $\frac{1}{2}$ x 6 in., 75-5; larger sizes, 70-10 off; hot pressed nuts, square head, \$6, and hexagon, \$6.70 off per cwt.

Cast Iron Pipe.—Public lettings for pipe last week were of little consequence, although the routine placing of miscellaneous small orders continues well up to the average. At Detroit 390 tons of high-pressure pipe is to be purchased for the fire commission. Prices are also being asked on small lots of pipe at Akron, Ohio, and Nickerson, Kan. Purchases of gas pipe were very meager as well. We quote as follows, per net ton, Chicago: Water pipe, 4 in., \$26; 6 to 12 in., \$24; 16 in. and up, \$23.50, with \$1 extra for gas pipe.

Wire Products.—The wire trade offers few features of interest. The market is nominally quoted at 1.55c., Pittsburgh, for wire nails, but new business ordinarily brings out quotations \$1 a ton lower. We quote to jobbers as follows: Plain wire, No. 9 and coarser, base, \$1.53 to \$1.58; wire nails, \$1.73 to \$1.78; painted barb wire, \$1.73 to \$1.78; galvanized, \$2.13 to \$2.18; polished staples, \$1.73 to \$1.78; galvanized, \$2.08 to \$2.13, all Chicago.

Hoops and Bands.—Buyers are confining their purchases to minimum requirements. Contracting is decidedly below normal in volume for this season of the year. We quote for Chicago delivery of bands 1.33c., and for hoops 1.43c.

Old Material.—The desire to turn scrap into cash before the close of the fiscal year is evidenced by the number of old material lists coming from the railroads, none of which carries a very heavy tonnage. The New York Central Lines has 2300 tons, the Wabash 1000 tons, the St. Paul 1000 tons, the Northern Pacific 900 tons, the Chicago & Eastern Illinois 400 tons, the Soo Line 1300 tons and the Toledo, St. Louis & Western 125 tons. The buying and selling of scrap has been reduced in this market to absolute essentials. No one seems anxious to buy and there is an equal disinclination to sell. We quote, for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Old iron rails	\$12.75 to \$13.25
Old steel rails, rerolling	11.50 to 11.75
Old steel rails, less than 3 ft.	10.50 to 11.00
Relaying rails, standard section, subject to inspection	24.00
Old carwheel	11.50 to 11.75
Heavy melting steel scrap	9.75 to 10.00
Frogs, switches and guards, cut apart	9.75 to 10.00
Shoveling steel	9.25 to 9.50
Steel axle turnings	6.75 to 7.25
Per Net Ton	
Iron angles and splice bars	\$12.00 to \$12.50
Iron arch bars and transoms	12.00 to 12.50
Steel angle bars	9.00 to 9.50
Iron car axles	16.50 to 17.00
Steel car axles	12.25 to 12.50
No. 1 railroad wrought	9.00 to 9.25
No. 2 railroad wrought	8.50 to 8.75
Cut forge	8.50 to 8.75
Steel knuckles and couplers	9.00 to 9.50
Steel springs	9.25 to 9.75
Locomotive tires, smooth	9.75 to 10.00
Machine shop turnings	5.00 to 5.50
Cast borings	4.50 to 5.00
No. 1 busheling	7.50 to 7.75
No. 2 busheling	6.00 to 6.25
No. 1 boilers, cut to sheets and rings	6.50 to 7.00
Boiler punchings	9.25 to 9.75
No. 1 cast scrap	9.75 to 10.25
Stove plate and light cast scrap	9.00 to 9.25
Grate bars	8.75 to 9.25
Railroad malleable	9.00 to 9.25
Agricultural malleable	8.00 to 8.50
Pipes and flues	6.50 to 7.00

Philadelphia

PHILADELPHIA, PA., June 9, 1914.

More active inquiry and in some directions more sales are noted in this market, but there has not been actual business proportionate to that in some other sections of the country. The latter has been a source of encouragement to the trade here. There is evidence of an awakening on the part of the railroads who are taking more steel products, such as tie plates and axles, while their car buying will mean the consumption of a large quantity of steel, some of which undoubtedly will be rolled in this territory. Rails have been quiet. The demand for wire has improved. Billets and sheets continue inactive, but bars and plates are showing more life. In pig iron inquiries are more frequent and, to some extent, sales also, and there is a growing disposition on the part of consumers to ask that shipments be hurried. The first cargo of Chilean ore for the Bethlehem Steel Company is now at this port.

Iron Ore.—The importations of ore at this port in the week ended June 6 were 6800 tons from Newfoundland and 18,686 tons from Sweden. Conditions are unchanged but importers find no tendency to postpone deliveries. The first cargo of ore from Chile consigned to the Bethlehem Steel Company arrived here June 7 on the British steamer Epsom, having been 46 days en route from Cruz Grande, via the Straits of Magellan. Reports of the extent of the cargo vary from 6000 to 8000 tons. This ship is to be followed by two other British vessels, the Twickenham and Earl of Douglass, each of which will bring similar cargoes.

Pig Iron.—It is generally acknowledged that buying is on the mend and inquiries are decidedly better, although pointed out at the same time is the fact that the iron business has not improved in this territory to the same extent it has in others. Stress is laid upon the increased number of local inquiries and further encouragement is drawn from the reports heretofore published of exports and good buying elsewhere, including the heavy contracts in which pipe makers figured, though the low prices are deplored. An inquiry now before the trade from the Norfolk & Western Railroad, calls for third quarter delivery of 600 tons of Bessemer, 450 tons of charcoal, 200 tons of No. 1 and 500 tons of No. 2 and 225 tons of No. 3 coke iron. Other inquiries specify 500 tons of No. 2X foundry and 500 tons of charcoal iron. Most of the others range smaller. Sales of foundry iron are being made at concessions and this restricts participation in the current business. Sales have been made well below \$14.75. In low phosphorus iron there has been but little interest, perhaps the best event being an inquiry for 400 tons and favorable terms will secure a concession. That consumers' supplies are low is again shown by a growing tendency on their part to ask that shipments be hurried. An inquiry from local makers of plumbers' supplies, referred to a week ago, has been closed, the buyers taking about 2000 tons of Nos. 2 and 3. Virginia iron has been moving better in the past few days and its prices continue unimpaired. Furnace stocks changed but slightly in May and the aggregate of orders was swelled by the good buying of basic. The following range of prices represents the general market for near delivery in buyers' yards in this district.

Eastern Penna. No. 2 X foundry	\$14.75 to \$15.00
Eastern Penna. No. 2 plain	14.50 to 14.75
Virginia No. 2 X foundry	15.55 to 15.75
Virginia No. 2 plain	15.30 to 15.55
Gray forge	13.75 to 14.00
Basic	14.00
Standard low phosphorus	20.50 to 21.00

Ferroalloys.—Occasional inquiries for carload lots of 80 per cent. ferromanganese are all that are coming out and for these \$38 per ton, seaboard, is asked for both English and German. Small lots of foreign ferrosilicon continue to arrive here. From Sweden there arrived last week 50 tons and from England, 25 tons. Quotations for 50 per cent. ferrosilicon are unchanged at \$71 to \$73, Pittsburgh, according to quantity.

Billets.—Inquiries are few, with open-hearth rolling billets quoted at \$22.40, Philadelphia. Forging steel is fully as quiet, if not more so, at the advance of \$4 to \$5 per ton over rolling billets.

Bars.—The market for iron bars has weakened still further and 1.17c. to 1.22½c., Philadelphia, is quoted on ordinary grades, with choicer stock running higher. In steel bars there has been a little spurt as compared with recent sales, but the total of orders was but fair. In current business 1.30c., Philadelphia, is asked, but 1.25c. is done where the inducement is sufficient.

Structural Material.—The Guerber Engineering Company, Bethlehem, which recently obtained a contract for building a coal breaker for the Delaware, Lackawanna & Western Coal Company, near Wilkes-Barre, involving about 1000 tons, has taken orders for two additional breakers for the same company, as was expected. The two breakers will require about 2800 tons. Estimates are being taken on about 1500 tons for an extension to the works of the Pennsylvania Sugar Refining Company in this city. As was forecast a week ago the Pennsylvania Railroad placed the seven-span bridge over the Schuylkill River with the Phoenix Bridge Company. The contract for 1500 or 1600 tons for a municipal building in Wilmington is about to be let. The miscellaneous demand for shapes has been rather good in the last week. Prices show no change at 1.25c. to 1.30c., Philadelphia.

Plates.—The outlook is better because of the freer buying of cars by the railroads, though none of this business has been felt in this territory as yet. Encouraging, also, is the fact that daily orders have been somewhat more numerous and a little heavier, while there are more requests for contracts for the third quarter and in some cases for the third and fourth quarters. Makers, however, are not eager to enter long contracts at present prices. Inquiries are being made by Delaware River shipyards, contingent upon their getting business, and some structural fabricators are asking for bids. Prices are unchanged at 1.30c., Philadelphia, for carloads and 1.25c. for larger lots.

Sheets.—Despite the nearness of the third quarter, orders continue to drag, though some interest is being shown by Middle Western automobile manufacturers. Local makers say their prices are at the bottom at 1.50c., Philadelphia, for No. 10 blue annealed sheets.

Coke.—Inquiry is livelier and some good sales have been made, though there is no general movement. Contracts entered involve 3000 tons of foundry coke in one case and 40 cars to be delivered in the next three months in another. Prompt or nearby furnace coke is held at \$1.75 to \$1.90 per net ton at oven, with contract at \$2, but at this latter price no business is being done. The minimum for prompt foundry is about \$2.50 at oven and contract is quoted at \$2.70 to \$2.75. Freight rates to this city from the producing districts are as follows: Connellsville, \$2.05; Latrobe, \$1.85, and Mountain, \$1.65.

Old Material.—The indications are better, particularly in the demand and prices for specialties, while the mills are showing more disposition to buy regular stock at low prices. In several lots, 1000 tons of heavy melting steel has been taken at \$10.75, delivered. In one or two cases low offers have been declined. The Pennsylvania Railroad issued a large list at the beginning of the month and all of the material was absorbed at comparatively good prices. The following quotations about represent the market for deliveries in buyers' yards in this district, covering eastern Pennsylvania and taking freight rates varying from 35c. to \$1.35 per gross ton:

No. 1 heavy melting steel	\$10.50 to \$11.00
Old steel rails, rerolling	12.00 to 12.50
Low phosphorus heavy melting steel	
scrap	14.50 to 15.00
Old steel axles	14.00 to 14.50
Old iron axles (nominal)	20.00 to 21.00
Old iron rails	15.00 to 15.50
Old carwheels	11.25 to 11.75
No. 1 railroad wrought	12.50 to 13.00
Wrought-iron pipe	9.50 to 10.00
No. 1 forge fire	8.00 to 8.50
Bundled sheets	8.00 to 8.50
No. 2 light iron	5.00 to 5.50
No. 2 busheling	8.00 to 8.50
Wrought turnings	7.75 to 8.25
Cast borlings	8.00 to 8.50
No. 1 cast	12.00 to 12.50
Grate bars, railroad	8.00 to 8.50
Stove plate	8.50 to 9.00
Railroad malleable	9.00 to 9.50

Cleveland

CLEVELAND, OHIO, June 9, 1914.

Iron Ore.—An interesting feature of the present situation is that there was less ore on Lake Erie docks June 1 than on May 1. On June 1 there was 5,772,462 tons of ore on the docks as compared with 5,919,717 tons on May 1. This decrease in ore on docks instead of an increase as usually shown is due to the light shipments from the Lake Superior district and shows that furnaces are using up their high-priced ore on the dock instead of the lower priced 1914 ore. The market is dragging along with practically no sales. We quote prices as follows: Old range Bessemer, \$3.75; Mesaba Bessemer, \$3.50; old range non-Bessemer, \$3; Mesaba non-Bessemer, \$2.85.

Pig Iron.—There is practically no inquiry for any grade. The foundry situation has not improved and most of the larger plants are being operated at about 50 per cent. capacity. Although consumers bought sparingly for delivery in the first half, a large share of foundries will have second quarter iron left over after July 1 and will not need to buy additional iron in the first few weeks of the third quarter. Some of the Valley furnaces are offering foundry iron at \$13 for delivery through the last half, but one interest is adhering to \$13.50 for any delivery. The only activity reported in Southern iron is the sale of 400 tons of No. 2 to a Cleveland consumer at \$10.50 for the last half delivery. We quote, delivered Cleveland, as follows:

Bessemer	\$14.90
Basic	\$13.75 to 13.90
Northern No. 2 foundry	14.25
Southern No. 2 foundry	14.85
Gray forge	13.50
Jackson Co. silvery, 8 per cent. silicon	17.55
Standard low phosphorus, Valley furnace	20.25

Coke.—A Cleveland foundry has contracted for 40 cars of Virginia coke for delivery until July 1, 1915, at \$2.50 and some last half contracts for Connellsville coke are being made at \$2.50 to \$2.65. Furnace coke is inactive with quotations at \$1.75 to \$1.85 per net ton at oven for prompt shipment and \$1.85 to \$2 for contract.

Finished Iron and Steel.—Many of the implement manufacturers are negotiating for steel bar contracts, but not much of this business has been placed as yet. Buyers want to contract for a full year's requirements, but most mills are declining to sell for delivery beyond the last half. Some contracts have been made at 1.15c. for the third quarter and 1.20c. for the fourth quarter, which represents the top of the market. Steel bars for prompt shipment are weaker. Some spot business has been taken at 1.10c. However, most mills are holding to from 1.12½c. to 1.15c. for current orders. Hard steel bars are selling down to 1.10c. There is little change in the general situation, although some of the selling agencies report a slight improvement in inquiry for material for early delivery. Plates are quoted at 1.10c. to 1.15c. New inquiry for structural material is exceedingly light. The King Bridge Company has taken 600 tons for repairing the Central viaduct in Cleveland. Sheets are not active and prices are irregular, quotations being 1.80c. for No. 28 black, 2.75c. to 2.80c. for No. 28 galvanized and 1.35c. for No. 10 blue annealed. There is very little demand for bar iron, which is quoted at 1.20c. Cleveland. Warehouse prices are 1.80c. for steel bars and 1.90c. for plates and structural material.

Bolts, Nuts and Rivets.—Some bolt contracts for the last half have been made at regular quotations and others are reported at a slight advance over these prices. Makers are refusing to quote for delivery beyond the end of the year. The market continues somewhat irregular and regular quotations are being shaded about 5 per cent. for current orders. Specifications have been improved somewhat. Rivets are dull with prices unchanged at 1.50c. for structural and 1.60c. for boiler. We quote discounts as follows: Common carriage bolts, ½ x 6 in., smaller or shorter, rolled thread, 80 and 5 per cent.; cut thread, 80 per cent.; larger or longer, 75 and 5 per cent.; machine bolts with h.p. nuts, ½ x 4 in., smaller or shorter, rolled thread, 80 and 10 per cent.; cut thread, 80 and 5 per

cent.; larger or longer, 75 and 10 per cent.; coach and lag screws, 80 and 15 per cent.; square h.p. nuts, blank or tapped, \$6.30 off; hexagon h.p. nuts, blank or tapped, \$7.20 off; c. p. c. and t. square nuts, blank or tapped, \$6 off; hexagon, ½ in. and larger, \$7.20 off; 9/16 in. and smaller, \$7.80 off; semi-finished hexagon nuts, ½ in. and larger, 85, 10 and 5 per cent.; 9/16 in. and smaller, 85, 10, 10 and 5 per cent.

Old Material.—Mills generally have all the material they need either under contract or in stock, so that there is little new demand. With the exception of material on cars, dealers are making little effort to sell scrap. There is a limited demand for heavy melting steel in Youngstown at \$11.50 to \$11.75. We note the sale of 200 tons of turnings for Brackenridge at \$7.85. Prices generally are unchanged. We quote, delivered Cleveland, as follows:

Per Gross Ton	
Old steel rails, rerolling	\$11.50 to \$12.00
Old iron rails	13.00 to 13.50
Steel car axles	15.00 to 15.25
Heavy melting steel	10.00 to 10.25
Old carwheels	11.25 to 11.50
Relaying rails, 50 lb. and over	23.00 to 25.00
Agricultural malleable	8.50 to 9.00
Railroad malleable	10.25 to 10.50
Light bundled sheet scrap	7.50 to 8.00

Per Net Ton	
Iron car axles	\$17.25 to \$18.25
Cast borings	5.50 to 6.00
Iron and steel turnings and drillings	5.25 to 5.50
Steel axle turnings	6.75 to 7.25
No. 1 busheling, new	8.50 to 8.75
No. 1 busheling, old	8.00 to 8.25
No. 1 railroad wrought	9.50 to 10.00
No. 1 cast	10.50 to 10.75
Stove plate	7.50 to 8.00

Buffalo

BUFFALO, N. Y., June 9, 1914.

Pig Iron.—Orders were placed for 25,000 tons of foundry malleable and basic irons, making the best single week's bookings for the past three or four months. Inquiry is broadening, indicating that buyers are beginning to take hold for present and nearby needs. Producers believe there will be a gradual, general improvement in demand from this time forward. Some foundries report slightly better business and are inclined to be quite optimistic, but in general the trade has not noted any marked change for the better. As a rule furnacemen are holding firmly to the following prices, f.o.b. furnace:

No. 1 foundry	\$13.50 to \$13.75
No. 2 X foundry	13.00 to 13.50
No. 2 plain	13.00 to 13.25
No. 3 foundry	13.00
Gray forge	13.00
Malleable	13.25 to 13.50
Basic	13.50 to 13.75
Charcoal, regular brands and analysis	15.75 to 16.75
Charcoal, special brands and analysis	20.50

Finished Iron and Steel.—While attractive tonnages of bars and plates could no doubt be placed at 50c. to \$1 a ton below the general market, the business would be for immediate specification and at mill's convenience only. No contracts are being written for future delivery at minimum prices. It is understood that several mills have submitted contract proposals calling for 1.15c., Pittsburgh base, for third quarter and that where buyers have insisted on buying for the full half have asked \$1 advance for fourth quarter. Several contracts have been closed on this basis. The general feeling appears to be a little better than a week or two ago. An order of 650 tons of rails is reported placed with the Lackawanna Steel Company by the International Railway Company of this city. Quite a large total of fabricated structural material is being figured on, but made up principally of small individual tonnage lots. Bids went in this week for 150 tons of steel for the West Side Brewing Company, Syracuse, and they are being taken for two public school buildings, Erie, Pa., requiring about 100 tons each. The Lackawanna Bridge Company, Buffalo, has 500 tons for the Sandusky River Power Company, Fremont, Ohio, and T. J. Bird, New York City, has 1000 tons to place for the Onondaga Hotel addition, Syracuse.

Old Material.—Business has been chiefly for small amounts, dealers being inclined to hold for higher prices as they are hopeful of better demand in the near future. Prices remain unchanged from last week and are as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	\$10.00 to \$10.50
Low phosphorus steel	14.50 to 15.00
Boiler plate sheared	11.50 to 12.00
No. 1 railroad wrought scrap	11.00 to 11.50
No. 1 railroad and machinery cast	11.00 to 11.50
Old steel axles	12.75 to 13.25
Old iron axles	21.00 to 21.50
Old carwheels	11.00 to 11.50
Railroad malleable	10.00 to 10.50
Machine shop turnings	5.25 to 5.75
Heavy axle turnings	7.50 to 8.25
Clean cast borings	6.00 to 6.50
Old iron rails	15.00 to 15.50
Locomotive grate bars	9.50 to 10.00
Stove plate (net ton)	9.75 to 10.00
Wrought pipe	7.50 to 8.00
Bundled sheet scrap	6.25 to 6.50
No. 1 busheling scrap	8.25 to 8.75
No. 2 busheling scrap	5.75 to 6.25
Bundled tin scrap	10.50

Cincinnati

CINCINNATI, OHIO, June 10, 1914.—(By Wire.)

Pig Iron.—A slight increase in both sales and inquiries is reported from several sources, but the majority of nearby foundries have all they can do to take care of shipments now overdue on old contracts. The small improvement mentioned cannot be attributed to any increase in the melt but is indicative of dwindling yard stocks and a more optimistic sentiment as to the general business future. Carload orders for foundry iron have lately been received from firms that usually buy much larger tonnages. The large sale of Southern iron to a pipe maker, recently reported as being made below the present general price, has served to stimulate the market, but at the same time it has been the cause for circulating reports that the Southern market price of \$10.50, Birmingham, had been broken. It is rumored that firm offers might be acceptable at \$10.25, Birmingham basis, for No. 2 foundry, by producers who are favored with a freight differential, but this cannot be confirmed with information as to any actual sales being made at the figure named. The largest general inquiry is from Evansville, Ind., for approximately 3000 tons of foundry iron for last half shipment. An Illinois melter wants a medium-sized tonnage of mixed Northern and Southern iron, and the 1000-ton inquiry from central Indiana previously mentioned is still before the trade. An eastern Ohio melter bought 400 tons of Southern No. 2 at \$10.50, Birmingham, for last-half shipment. Other smaller sales were made in this territory at the same price. The malleable inquiry for 2000 tons to be shipped to St. Louis territory is yet unclosed. There is a small demand for high manganese iron from different sources. Based on freight rates of \$3.25 from Birmingham and \$1.20 from Ironton we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft.	\$14.25 to \$14.75
Southern coke, No. 2 f'dry and 2 soft.	13.75 to 14.25
Southern coke, No. 3 foundry	13.25 to 13.75
Southern No. 4 foundry	12.75 to 13.25
Southern gray forge	12.25 to 12.75
Ohio silvery, 8 per cent. silicon	17.20 to 17.70
Southern Ohio coke, No. 1	15.70 to 16.20
Southern Ohio coke, No. 2	14.70 to 15.20
Southern Ohio coke, No. 3	14.45 to 14.70
Southern Ohio malleable Bessemer	14.70 to 15.20
Basic, Northern	14.70 to 15.20
Lake Superior charcoal	15.25 to 17.25
Standard Southern carwheel	27.25 to 27.75

(By Mail)

Coke.—Foundry operators are contracting for a limited tonnage of 72-hr. coke. While a number of producers are willing to take on business for the usual 12-month period, others are holding back, and only want business for this year's movement. So many foundries in this vicinity have coke due on old contracts, which they have been unable to use, that it is doubtful if the total business booked this summer will reach anything like the average mark. The furnaces are still holding back, and no new contracts have come to light in the Hanging Rock district, although several pig-iron producers will soon be compelled to purchase if they expect to continue operating through the year. Prices are unchanged around \$1.75 to \$1.80 per net ton

f.o.b. Connellsville, for prompt shipment furnace coke, with 10c. added on contract business. Wise County and Pocahontas furnace coke quotations are approximately 10c. higher than Connellsville for either prompt or deferred shipment. Foundry coke is quoted at \$2.50 to \$2.75 in all three fields, but some prompt shipment coke can be bought both in the Connellsville and Pocahontas fields around \$2.40, with a probable chance to shade this figure on desirable business.

Finished Material.—Sentimentally, the market in a number of lines shows some betterment. There is also a slight improvement in actual business booked, probably most marked in small structural shapes. Large orders are scarce. This same condition is applicable to reinforcing concrete bars. There is no change in the sheet situation, with the possible exception of a few more inquiries for prices for future shipment, but the mills in this territory are not disposed to book future business at present market figures. The local mill has withdrawn all quotations, and is not inclined to accept any business at present prices, except for prompt shipment. We quote No. 28 black sheets at 1.95c. f.o.b. Cincinnati, or Newport, Ky., and No. 28 galvanized, 2.95c. Warehouse prices on steel bars remain around 1.75c. to 1.80c., and on structural shapes, 1.80c. to 1.85c. The railroads in this vicinity are buying but little track material of any kind. Hoops and bands are very slow sellers.

Old Material.—No change has taken place, business in all grades of scrap continuing very light. Buyers are still holding back. The minimum figures given below represent what buyers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices f.o.b. at yards:

Per Gross Ton	
Bundled sheet scrap	\$6.75 to \$7.25
Old iron rails	11.75 to 12.25
Relaying rails, 50 lb. and up	19.75 to 20.25
Rerolling steel rails	10.75 to 11.25
Melting steel rails	9.25 to 9.75
Old carwheels	10.25 to 10.75

Per Net Ton	
No. 1 railroad wrought	\$8.75 to \$9.25
Cast borings	4.50 to 5.00
Steel turnings	4.50 to 5.25
Railroad cast scrap	9.25 to 9.75
No. 1 machinery cast scrap	10.25 to 11.25
Burnt scrap	6.00 to 6.75
Old iron axles	16.75 to 17.25
Locomotive tires (smooth inside)	9.75 to 10.25
Pipes and flues	6.25 to 6.75
Malleable and steel scrap	7.25 to 7.75
Railroad tank and sheet scrap	5.25 to 5.75

Birmingham

BIRMINGHAM, ALA., June 8, 1914.

Pig Iron.—The aggregate of Alabama pig-iron sales in the last 10 days of May and the first week of June was something like 175,000 tons, and possibly more, if the export bookings by the leading interest are also taken into consideration. This is decidedly in excess of transactions in any similar period since December, 1913. Up to June 5 one company had sold over 50,000 tons, another a trifle less, a third 30,000 tons, a fourth probably as much and so on. One sale was made in Chicago territory of 8000 tons. The basis of sales was \$10.25 to \$10.50 to the leading pipe interest, and \$10.50 for Southern territory and small purchases. It is reported that some of the pipe iron of special make sold under \$10.25, but this is not established. However, it is known that one maker's offer of 35,000 tons at \$10.25 was declined. Then again a consumer's offer of \$10 for a round tonnage was declined. Along with the large sales to pipe interests, and immediately following, came a flood of inquiries from all round, indicating a decided tendency to sound the market, to say the least. There is a little apprehension that some purchasers and would-be purchasers are desirous of speculating rather than securing iron for immediate consumption. The asking price, which appears very general, is now \$10.50 for the remainder of the third quarter, with \$10.75 for the fourth. Even small lots for Southern delivery can be had at \$10.50. Manufacturers feel better, but they are not satisfied with the

price basis, which is too near the cost of making, and does not yet indicate a tendency to advance over levels existing prior to the pipe interest purchases. We quote, per gross ton, f. o. b. Birmingham, for third and fourth quarter as follows:

No. 1 foundry and soft	\$11.00 to \$11.25
No. 2 foundry and soft	10.50 to 10.75
No. 3 foundry	10.00 to 10.25
No. 4 foundry	9.75 to 10.00
Gray forge	9.50 to 9.75
Basic	10.25 to 10.50
Charcoal	23.50 to 24.00

Cast-Iron Pipe.—The cast-iron pipe market is holding its own along lines existing for some time, with a 60 per cent. capacity output and no accumulations. The Hammond-Byrd Company, Birmingham, has contracted with the National Cast Iron Pipe Company to act as its exclusive sales agent in all territory. The plant, a new one, is operating regularly on a 100-ton per diem capacity. Sanitary pipe is selling in ordinary quantities. We quote, per net ton, f. o. b. dealers' yards, as follows: 4-in., \$20.50; 6-in. and upward, \$18.50, with \$1 added for gas pipe. The demand for 4-in. pipe has improved and the American Cast Iron Pipe Company reports regular sales of its new 16-ft. lengths.

Coal and Coke.—The larger coal companies have been closing some sizable contracts and pushing their business in Southern ports, but the small domestic mines are still partially idle. A gradual improvement, however, seems to have set in. The leading interest failed to land the large contract to supply navy vessels in Galveston, but some coal for Government use is going to Pensacola. The coke market is featured by considerable dickering from a wide trade territory, with the prospect of a good deal of business being placed in the near future. The city of Birmingham and the Birmingham Railway, Light & Power Company have about come to terms for the use of by-product gas from the plant of the Tennessee Company at Ensley. We quote, per net ton, f. o. b. oven, as follows: Furnace coke, \$2.70 to \$3; foundry, \$3.20 to \$3.35.

Old Material.—The scrap market is very quiet and there are large stocks in dealers' yards. The feeling is more cheerful, however, and there seems to be a general expectation of a revival of trade. We quote, per gross ton, f. o. b. dealers' yards, as follows:

Old iron axles	\$14.50 to \$15.00
Old steel axles	14.50 to 15.00
Old iron rails	13.00 to 13.50
No. 1 railroad wrought	10.00 to 11.00
No. 2 railroad wrought	8.50 to 9.00
No. 1 country wrought	9.00 to 10.00
No. 2 country wrought	8.00 to 9.00
No. 1 machinery cast	9.50 to 10.00
No. 1 steel scrap	8.00 to 8.50
Tram carwheels	9.50 to 10.00
Standard carwheels	10.50 to 11.00
Stove plate	8.00 to 8.50

St. Louis

ST. LOUIS, Mo., June 8, 1914.

Pig Iron.—Inquiry has increased considerably and sales have been reported by one interest aggregating about 4000 tons, but it is understood that this has gone to brokers who will distribute it in smaller lots to their own customers. Other inquiries reported include one for 2000 tons, one for 1000 tons, several for 500 tons and a considerable number of smaller quantities running close to a total of 10,000 tons. All this is for No. 2 Southern. There are also several inquiries out for No. 3 Southern in 500-ton and smaller lots. The feeling seems to be that a buying movement is about to take place, and while prompt delivery prices are not so steady as they might be there is no desire to make concessions of moment for third or fourth quarters.

Coke.—Several interesting inquiries are in the market. One is for 1500 tons part 48-hr. and part 72-hr.; another is for 1800 tons, chiefly 72-hr. These are for delivery over the next twelve months. Settlement of prices is holding off the closing of the contracts for foundry coke. By-product coke is quoted here on a basis of \$4, Indianapolis, or \$5.20, delivered St. Louis. This is below the Connellsville oven price for beehive coke, and the recent large sales are accounted for thereby.

Finished Iron and Steel.—General business is continuing to show improvement in general volume and a spread of source of demand. In standard steel rails the prospect of a purchase of about 33,000 tons under court approval by the Frisco System receivers is attracting a good deal of interest.

Old Material.—It is strictly a dealers' market, and even the dealers are interested only in prices which give strong assurance of a good profit to lay down in the yards against the future. Dealers' yards are about as full of material as the dealers care to have them, while outcoming lists continue to depress the market. Railroad lists of the week include 1000 tons from the Mobile & Ohio, 200 tons from the Clover Leaf, 3000 tons from the Texas & Pacific, 3400 tons from the Big Four, 1900 tons from the Wabash, 100 tons from a local industry and more anticipated shortly. We quote dealers' prices, f.o.b. St. Louis, as follows:

Per Gross Ton	
Old iron rails	\$10.50 to \$11.00
Old steel rails, rerolling	10.50 to 11.00
Old steel rails, less than 3 ft.	10.00 to 10.50
Relaying rails, standard section, subject to inspection	21.00 to 23.00
Old carwheels	10.50 to 11.00
No. 1 railroad heavy melting steel scrap	9.75 to 10.25
Shoveling steel	7.50 to 8.00
Frogs, switches and guards cut apart	9.50 to 10.00
Bundled sheet scrap	4.25 to 4.75

Per Net Ton	
Iron fish plates	\$9.50 to \$10.00
Steel angle bars	8.00 to 8.25
Iron car axles	16.75 to 17.25
Steel car axles	11.75 to 12.25
Wrought arch bars and transoms	10.50 to 11.00
No. 1 railroad wrought	7.50 to 7.75
No. 2 railroad wrought	7.25 to 7.50
Railroad springs	8.00 to 8.50
Steel couplers and knuckles	8.25 to 8.75
Locomotive tires, 42 in. and over, smooth	8.75 to 9.25
No. 1 dealers' forge	7.25 to 7.75
Mixed borings	3.25 to 3.75
No. 1 busheling	6.75 to 7.25
No. 1 boilers, cut to sheets and rings	5.25 to 5.75
No. 1 cast scrap	8.50 to 9.00
Stove plate and light cast scrap	7.00 to 7.50
Railroad malleable	7.00 to 7.50
Agricultural malleable	6.50 to 7.00
Pipes and flues	5.00 to 5.50
Railroad sheet and tank scrap	5.00 to 5.50
Railroad grate bars	6.50 to 7.00
Machine shop turnings	4.25 to 4.75

New York

NEW YORK, June 10, 1914.

Pig Iron.—The past week has developed more business in pig iron than the preceding one, and there is fair promise for the immediate future, though the market can by no means be called active. An eastern Pennsylvania furnace company, which has taken similar contracts heretofore, will furnish the 10,000 tons of basic iron for Bridgeport, Conn., which has been before the trade for two or three weeks. The advantage of water shipment in this case lay with the East as against Buffalo competition. A 10,000-ton inquiry for basic for Buffalo district delivery has come up in New York City. The business is understood to be still open, though it would naturally go to a Buffalo producer. Low prices were made on two lots of 900 tons for Paterson, N. J., delivery, the irons being graded as No. 1 and No. 2 plain, respectively. The former went to a Pennsylvania furnace west of the Alleghenies at a price close to \$14.75 delivered, and the latter to a Lehigh Valley producer at about \$14.15 delivered. A sale of 500 tons and another of 1000 tons have been made to other New Jersey foundries. Foundry operations are slightly increased in some directions, and in others activity has fallen off. Some close figuring is being done on the East River tunnel segments, with correspondingly close competition for the large amount of pig iron involved. The business is expected to be awarded this month. We quote Northern iron for tidewater delivery as follows: No. 1 foundry, \$14.75 to \$15; No. 2 X, \$14.50 to \$14.75; No. 2 plain, \$14.25 to \$14.50; Southern iron, \$15 to \$15.25 for No. 1 and \$14.75 to \$15 for No. 2.

Ferroalloys.—Only sales of small lots of 80 per cent. ferromanganese and 50 per cent. ferrosilicon are moving. An inquiry for about 500 tons of 50 per cent.

ferrosilicon is said to be before the market. Quotations for ferrosilicon remain at \$71 to \$73, Pittsburgh, depending on the tonnage, while ferromanganese is selling at \$38, seaboard, whether it be the English or German product.

Finished Iron and Steel.—A betterment in specifications on contracts but no betterment in prices, and a generally fair percentage of manufacturing capacity in operation describes the general situation. More is heard of business at the lower prices obtaining in recent weeks. The better appearance given to the local fabricating market through the development of new fair-sized projects continues as a highly encouraging factor, and bridge and structural shops are accordingly well engaged, not a few for as much as three months. The Illinois Central distribution of cars has been made, 1000 to the American Car & Foundry Company, 1000 to the Western Steel Car & Foundry Company, 500 to the Haskell & Barker Car Company and 500 cars to the Standard Steel Car Company. It appears also that the New York Central has arranged to purchase 7300 cars, 4300 from the American Car & Foundry Company and the remainder from the Standard Steel Car Company, but it is understood that the transaction involves the acceptance in part by the builders of promissory notes. The Havana Central has bought 350 cars from the Standard Steel Company and 40 from the Magor Car Company. In the structural field the new work coming into the market includes 1000 tons for the Pennsylvania Refining Company, Philadelphia; 1500 tons for a municipal building, Wilmington, Del.; 2000 tons for a Goelet building, Twenty-eighth street and Madison avenue, New York; 2100 tons for an addition to the Bonwit-Teller building, Fifth avenue and Thirty-eighth street, New York; 5000 to 7500 tons for a subway terminal, Newark, for the Public Service Corporation, New Jersey; a large armory in Boston, Mass. The contracts closed since the last report include 2500 tons for the Boston & Maine at Saratoga Junction, N. Y., to the Pennsylvania Steel Company; 700 tons for the American Eveready Company, Long Island City (National Carbon Company), to the Levering & Garrigues Company; 1500 tons for the Minsi Trail bridge, near Bethlehem, Pa., to the McClintic-Marshall Company; 2100 tons for the Pennsylvania Railroad, to the Phoenix Iron Company; 450 tons for the Harvard Club addition, to Eidlitz & Ross; 700 tons for the Antler loft, Thirty-eighth street, to the Passaic Steel Company; 300 tons for the Mountainside Hospital, Glen Ridge, N. J., and 350 tons for the New York & Queens Electric Light & Power Company, Jamaica, L. I., both to the Hedden Iron Construction Company. We quote mill shipments of steel bars at 1.12½c. to 1.15c. Pittsburgh, or 1.28½c. to 1.31c. New York; plates and structural, 1.10c. to 1.15c. Pittsburgh, or 1.26c. to 1.31c. New York, and iron bars at 1.22½c. to 1.27½c. New York. For lots from store we quote iron and steel bars at 1.80c. to 1.85c. New York, and plates and shapes, at 1.85c. to 1.90c.

Cast-Iron Pipe.—Albany, N. Y., will open bids June 15 on 1200 tons of 6 to 20 in. The Metropolitan Water and Sewerage Board, Boston, will open bids June 19 on 2100 tons of 8 to 24 in. The recent purchase of 6300 tons by Troy, N. Y., was made at \$21.40 delivered. Private buying continues to expand, but very gradually. While the outlook is becoming more encouraging to pipe manufacturers, they have not yet been able to get better prices. Too much productive capacity is still unemployed. Carload lots of 6-in. continue to be available at \$20.50 to \$21 per net ton, tidewater.

Old Material.—While dealers are becoming more hopeful, in the belief that a better demand is to be expected in the near future, immediate conditions show no improvement. Eastern Pennsylvania buyers of heavy melting steel scrap are reducing their offers, some of them bidding only \$10 delivered. Dealers having contracts to fill are paying up to \$10.50. Rolling-mill stock and cast scrap continue neglected. Old carwheels are in still greater supply and prices are weaker. Dealers' quotations are as follows, per gross ton, New York:

Old girder and T rails for melting	\$8.00 to	\$8.25
Heavy melting steel scrap	8.00 to	8.25
Relying rails	21.50 to	22.00
Rerolling rails	10.00 to	10.50
Iron car axles	17.50 to	18.00
Steel car axles	11.75 to	12.25
No. 1 railroad wrought	10.00 to	10.50
Wrought-iron track scrap	9.00 to	9.50
No. 1 yard wrought, long	8.50 to	9.00
No. 1 yard wrought, short	8.00 to	8.50
Light iron	3.25 to	3.50
Cast borings	5.75 to	6.00
Wrought turnings	5.50 to	5.75
Wrought pipe	7.50 to	8.00
Carwheels	9.50 to	10.00
No. 1 heavy cast, broken up	10.50 to	11.00
Stove plate	7.50 to	8.00
Locomotive grate bars	6.00 to	6.25
Malleable cast	7.25 to	7.75

Boston

BOSTON, MASS., June 9, 1914.

Old Material.—The dealers are hoping that the buying movement which normally opens early in August will start somewhat earlier this season. The big months of the year in the local scrap market are from August to about December 1. The stagnation has been so protracted that the possibility exists of a slightly earlier opening of the fall buying. Prices have not changed, nor are other conditions altered. The quotations given below are based on prices offered by the large dealers to the producers and to the small dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points which take Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of \$2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices:

Heavy melting steel	\$8.25 to	\$8.50
Low phosphorus steel	13.75 to	14.75
Old steel axles	13.25 to	13.75
Old iron axles	21.25 to	21.75
Mixed shafting	12.00 to	12.25
No. 1 wrought and soft steel	9.00 to	9.25
Skeleton (bundled)	5.50 to	5.75
Wrought-iron pipe	7.50 to	7.75
Cotton ties (bundled)	6.00 to	6.25
No. 2 light	3.75 to	4.25
Wrought turnings	5.00 to	5.50
Cast borings	5.00 to	5.50
Machinery, cast	11.25 to	11.50
Malleable	8.00 to	8.25
Stove plate	7.75 to	8.00
Grate bars	5.25 to	5.50
Cast-iron carwheels	11.00 to	11.25

British Market at Standstill

Buyers Awaiting Developments in German Combinations on Bars and Other Finished Steel

(By Cable)

LONDON, ENGLAND, June 10, 1914.

The market is very dull and featureless, much depending on German developments regarding bars, sheets, etc. Meantime finished material about maintains its position, though buying is less active. The number of furnaces in blast in Scotland, Cleveland and Cumberland is 167, against 168 last week, and 205 at this time one year ago. The stocks of pig iron in Conna's stores are 86,036 gross tons, against 84,236 tons a week ago. Receipts of tin plates at Swansea the past week were 93,000 boxes and shipments 124,000 boxes; stocks are 229,000 boxes. We quote as follows:

Tin plates, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 12s. 1½d. (\$2.95), against 12s. 3d. (\$2.98) a week ago.

The following prices are per ton of 2240 lb.:

Cleveland pig-iron warrants (Tuesday), 51s. 2d. (\$12.45), against 51s. 5d. (\$12.51) a week ago.

No. 3 Cleveland pig iron, makers' price, f.o.b. Middlesbrough, 51s. 6d. (\$12.53), against 52s. (\$12.65) a week ago.

Hematite pig iron, f.o.b. Tees, 61s. (\$14.84).

Sheet bars (Welsh), delivered at works in Swansea Valley, £4 10s. (\$21.89).

Steel bars, export, f.o.b. Clyde, £5 17s. 6d. (\$28.59).

Steel joists, 15-in., export, f.o.b. Hull or Grimsby, £5 12s. 6d. (\$27.37).

Steel ship plates, Scotch, delivered local yards, £5 15s. (\$27.98).

Steel black sheets, No. 28, export, f.o.b. Liverpool, £8 15s. (\$42.58).

Steel rails, export, f.o.b. works port, £5 15s. (\$27.98).

The following prices are per export ton of 1015 kilos, equivalent to 2237.669 lb.:

German sheet bars, f.o.b. Antwerp, 78s. (\$18.98).

German 2-in. billets, f.o.b. Antwerp, 73s. (\$17.75).

German basic steel bars, f.o.b. Antwerp, £4 5s. to £4 6s. (\$20.69 to \$20.92) for prompt shipment and £4 6s. to £4 8s. (\$20.92 to \$21.41) for forward delivery.

German joists, f.o.b. Antwerp, £5 2s. to £5 5s. (\$24.82 to \$25.55).

Freight rates from Antwerp to New York, Boston, Philadelphia and Baltimore, per 1000 kilos (2204 lb.), are about as follows: Billets, blooms and bars, up to 20 ft., 9s. to 10s. (\$2.19 to \$2.43). Iron and steel sheets, 11s. to 12s. 6d. (\$2.68 to \$3.04). Beams up to 30 ft., 12s. 6d. (\$3.04).

(By Mail)

Continental Sellers of Bars and Other Products Are Firmer

LONDON, May 29, 1914.

There is still a marked dearth of new business, while prices on the whole fail to get any stiffness. In pig iron the only new factor is the sale within the past few days of some American basic iron to South Wales, and the mere fact that the price at which the business was done has not yet come out does not alter the significance of the operation. The position of Cleveland iron is regarded as artificial. There is no doubt that the makers have resolved, for a time at all events, to put an end to speculative dealings in warrants. By holding for considerably higher prices than those ruling for warrants they have turned demand upon the public stores which are being rapidly depleted, while output is being held in check partly by the high cost of coke. Production of Cleveland iron is very restricted, and the price stands at relatively too high a level, but with no indication of an early return to normal. All other descriptions of pig iron are on the easy side. Unsatisfactory accounts are now being given of hematite, which is feeling the effect of the slackening in demands for finished steel. Ore seems to be easier. Probably Rubio could be bought at about 17s. (\$4.14) c.i.f. for 50 per cent. grade.

Finished Steel Situation Better.

The position of the finished trades is no better, but at the same time the improvement in the Continental situation, owing to the efforts which are being made to strengthen the Verband, efforts which it is pretty confidently felt in the highest quarters will be crowned with success. On the strength of them prices of foreign merchant bars have advanced with a rush. This class of material had been specially attacked by merchants, whose bearing tactics have been bitterly resented by the works. Basic bars have been sold in fair quantities to Japan by merchants at 94s. (\$22.87) c.i.f. Japan, equal to about 77s. (\$18.73) f.o.b., but it is certain that no covering has been possible at anything like this price. To-day for forward shipments the Germans ask up to 88s. (\$21.42) f.o.b., which figure is said to have been actually done, though this is considered doubtful. Works have sold, however, at 86s. (\$20.93) f.o.b. against about 80s. (\$19.47) at the lowest recently accepted.

In semi-finished steel there is no change. Some of the French works withdrew offers when the negotiations regarding the renewal of the conventions dealing with bars, etc., were resumed, but have since come into the market again and accepted 79s. 6d. (\$19.34) c.i.f. for sheet bars, Newport. This is the price to-day, but the Stahlwerks Verband requires 82s. 6d. (\$20.08) c.i.f. and of course is not doing business. The reports that the Steel Corporation has sold heavily of sheet bars in Wales at 78s. (\$18.98) are untrue. The corporation has not sold any semi-finished steel to the United Kingdom for months past and anyhow there is no reason why it should cut the price to 78s. (\$18.98) c.i.f., when other makers can get 79s. 6d. (\$19.34).

The feature in rails is the capture of a big Queens-

land order by the Steel Corporation and the high price it got. Definite information is not to be had, but report puts the total quantity at 3500 tons and the price at about £5 15s. (\$27.98) f.o.b. The specification, however, is said to have been a difficult one and to account for the price to a great extent.

German Trade Holds Its Own

Increase in April Exports—Consumers Complain of High Pig-Iron Prices

BERLIN, May 28, 1914.

The movement in the iron trade since a week ago has been somewhat irregular, being influenced by the varying prospects for the completion of the finished steel organizations. There is a tendency in the press, and especially on the stock exchanges, to magnify whatever improvement has been reported.

It is satisfactory to record, however, that higher export quotations for two classes of products were reported about the end of last week for the first time in some months, namely, on steel bars and rivet bars, each about 1s. (24c.) per ton. On the other hand, band iron was marked down 1s. and ordinary wire, Nos. 0 to 8, from 117s. 6d. (\$28.59) to 115s. (\$27.98).

The Steel Works Union held its monthly meeting yesterday and gave out its usual market survey. It says that the situation in the home trade in semi-finished steel has hardly changed but that a further reduction in the demand has not occurred. Foreign trade is quiet, but in the British market a tendency to provide for future requirements is not infrequently met with. Sales in the home trade for the next quarter were declared opened at unchanged prices. In steel rails the Prussian roads have placed orders for their supplementary requirements for the current year, and a considerable order for the African colonies, extending over several years, has also been taken. German minor railroads have placed good orders for light rails. Business in mining rails is quiet, and foreign business is hurt by Belgian competition. Grooved rails are in a satisfactory position, further orders having come in from the home and the foreign trade. Specifications in structural shapes, which had slackened up somewhat in April, have been more active in May. In the home trade, however, there is still no inclination to place orders for long periods.

The Pig Iron Syndicate also met this week and decided to continue during the next quarter the existing price scale, in the face of strong efforts to induce it to make reductions. Foundrymen are complaining bitterly over the continuance of high prices. Other consumers are also disappointed. It is complained in particular that German hematite is kept up to 79.50 marks (\$18.91), whereas the English price is 61 marks (\$14.51), and that No. 1 foundry of German make is held at 75.50 marks (\$17.96), against 70.50 marks (\$16.77) in England. It is noted that the Syndicate departed from its usual practice of fixing the price for a half-year and continued the scale only for the next quarter. Moreover, it explicitly left open the possibility of changing prices at any time when foreign competition may make it necessary.

The Rod Association has just begun selling for the September quarter at unchanged prices, and it is reported that a better demand has sprung up since the association was prolonged for another quarter; the mills are running on full time. There is also sufficient work in hand in wire and wire nails, but at very unsatisfactory prices. In steel tubing the previous sharp competition and price-cutting continue undiminished. Orders for heavy plates are running lower, and many of the mills, especially in the Siegerland region, are compelled to run on a restricted scale. Sheets are doing somewhat better: consumers show a disposition to place longer orders than hitherto.

From the negotiations for organizing the finished steel trades there is little news. The heavy plate mills met yesterday to take the initial steps to or-

ganize, and committees were appointed to prepare the details. It is reported that the total allotments demanded in the projected bar combination reach approximately 6,000,000 tons, whereas the allotments three years ago, when the Steel Works Union was still fixing quotas in these products, aggregated somewhat less than 3,500,000 tons, and the total asked for in the negotiations carried on about a year ago was 5,000,000 tons.

The news from the Belgian trade for a week has been changeable—at first bad, then turning for the better. A market review from Belgium says: "A noteworthy change has suddenly taken place in the Belgium iron market. The export trade in bars has undergone such a revival the past week that it would not be difficult for the works to dispose of the most of their product to the end of the year at considerably better prices." A dispatch from Longwy states that the French Beam Association is selling large quantities to the end of November at the existing relatively high price of 190 francs (\$36.67). The continued prosperity of the Russian iron trade is evidenced by the fact that the orders of the Prodameda, or steel association, for the first four months of this year reached 51,400,000 pounds (826,071 gross tons), which is 15.5 per cent. more than for the corresponding months of 1913.

The exports of German iron and steel created a new record in April with a total of 636,652 metric tons, against 567,150 tons in April, 1913. The increase was secured, however, at a considerable sacrifice of profits; for while there was a gain of nearly 12 per cent. in quantity, the gain in total value was less than 3 per cent.

Metal Market

NEW YORK, June 10, 1914.

The Week's Prices

Cents Per Pound for Early Delivery									
Copper, New York	Electro-	Tin, New York	Lead		Spelter		Cents per lb.		
			New	St.	New	St.			
June	Lake	Electrolytic	30.75	3.90	5.10	4.95	13.25 to 13.50		
3	14.25	14.00	30.95	3.90	5.10	4.95	12.75 to 13.00		
4	14.25	14.00	30.40	3.90	5.10	4.95	12.00 to 12.25		
5	14.25	14.00	30.70	3.90	5.10	4.95	9.00 to 9.25		
6	14.25	14.00	30.65	3.90	5.10	4.95	7.50 to 7.75		
8	14.12 1/2	14.00	30.65	3.90	5.10	4.95	12.00 to 12.25		
9	14.12 1/2	13.87 1/2	30.65	3.90	5.10	4.95	8.75 to 9.00		

Copper is lower and dull, but buying is expected to come soon. Tin has been quiet and its price fairly uniform. The lead market continues to be a waiting one. Spelter is without change. Antimony is uninteresting.

New York

Copper.—The price of electrolytic is down to 13.87 1/2c., cash, New York, as a result of an unfavorable domestic interpretation of the Copper Producers' statement for May, showing that stocks had increased 14,005,640 lb. The producers' agencies did not announce a reduction to the figure named yesterday, but nevertheless the metal could be obtained without trouble at 14c., delivered, cash 30 days, which is equal to 13.87 1/2c., cash, New York. The decline came about in the afternoon, sales having been made in the morning at 1/4c. higher. Throughout the week the market has been dull and with few interesting features, one of which, however, was the sale in the latter part of last week of some prime Lake at 14.25c. Other brands of Lake which are not regarded as prime have sold nearly 20 points less and yesterday a carload of good quality Lake was reported to have sold at a shade under 14c., but this is regarded as an exceptional circumstance. A peculiarity of the present situation is that while domestic consumers regard the May report as unfavorable there seems to be a reverse opinion in Europe and in two days the price there has gone up 15s. In this country there are those who point out that the showing of the statement is not so bad as was expected inasmuch as domestic deliveries totaled 55,592,170 lb., and the increase in supply was really 6,000,000 lb. less than was predicted. Quotations in London to-day were £62 5s. for spot and £62 17s. 6d. for futures. Exports this month total 11,808 tons.

Tin.—At no time in the week was there any buying worthy of note and the price has changed but a few points, having been kept fairly uniform at about the import cost by the short supply and its concentration. Both consumers and speculators seem determined to leave the market alone for the present. There is but little buying of spot and practically none of futures. The New York quotation yesterday was 30.65c. and the London prices to-day are £140 10s. for spot and £142 10s. for futures. The arrivals this month total 1375 tons and there is afloat 1193 tons.

Lead.—The dullness of recent weeks has continued, there is no disposition to shade prices and the market is a waiting one. The metal cannot be had for less than 3.80c., St. Louis, and last week a little more was paid, but the market quickly settled back again. There are reports that inquiries from Europe have resulted in a few sales, but these have not been confirmed. With regard to price tendencies it is certain that quotations here will not go lower until London prices decline. The New York price is 3.90c.

Spelter.—No change can be reported in spelter which is dull at 5.10c. to 5.15c., New York, and 4.95c. St. Louis.

Antimony.—Stocks are plentiful and business is dull. Hallett's is quoted at 6.87 1/2c. to 7c., Cookson's, 7.12 1/2c. to 7.20c., and other grades at 5.75c. to 6c.

Old Metals.—The market is dull and unchanged Dealers' selling prices are as follows:

Copper, heavy and crucible	13.25 to 13.50
Copper, heavy and wire	12.75 to 13.00
Copper, light and bottoms	12.00 to 12.25
Brass, heavy	9.00 to 9.25
Brass, light	7.50 to 7.75
Heavy machine composition	12.00 to 12.25
Clean brass turnings	8.75 to 9.00
Composition turnings	11.00 to 11.25
Lead, heavy	3.65
Lead, tea	3.40
Zinc scrap	4.25

Chicago

JUNE 8.—Little change is noted in the copper market but the large increase in stocks is expected to have an adverse influence. Pig tin, which dropped during the week, has reacted slightly toward higher levels. Other quotations are unchanged. We quote as follows: Casting copper, 14.25c.; Lake copper, 14.50c. to 14.75c. for prompt shipment; small lots, 1/4c. to 1/4c. higher; pig tin, carloads, 31 1/2c.; small lots, 33 1/2c.; lead, desilverized, 3.85c., and corrodin, 4.10c., for 50-ton lots; in carloads, 2 1/2c. per 100 lb. higher; spelter, 5c. to 5.10c.; Cookson's antimony, 9.50c. for cask lots; other grades, 8c.; sheet zinc, \$7, f.o.b. La Salle or Peru Ill., less 8 per cent. discount in carloads of 600-lb. casks. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 11.50c.; copper bottoms, 10.25c.; copper clips, 10.75c.; red brass, 10.75c.; yellow brass, 7.50c.; lead pipe, 3.30c.; zinc, 3.50c.; pewter, No. 1, 23c.; tinfoil, 26c.; block tin pipe, 29c.

St. Louis

JUNE 8.—Metals have been fairly steady. Lead closed at 3.82 1/2c.; spelter, 4.97 1/2c.; tin, 30.65c. to 30.85c.; Lake copper, 14.60c. to 14.70c.; electrolytic copper, 14.47 1/2c. to 14.60c.; Cookson's antimony, 7.60c. to 7.75c. In the Joplin ore market the best basis price reported for zinc blende was \$41 per ton for 60 per cent., which was a gain of about \$1 over the week before. The settlement for the choicest lots ran as high as \$43.50 to \$44. Calamine continued firm at \$21 to \$23, with the top settlement reaching \$27. Lead ore was firm at \$46 for 80 per cent. Miscellaneous scrap metals are quoted as follows: Light brass, 5.50c.; heavy yellow brass, 8c.; heavy red brass and light copper, 10c.; heavy copper and copper wire, 11c.; zinc, 3c.; lead, 3.25c.; pewter, 23c.; tinfoil, 27c.; tinfoil, 3c.

The Interstate Commerce Commission has ordered all railroads to file with the commission before the tenth of each month statements showing the location of all freight cars. This information will be used in determining complaints of shippers of discrimination in furnishing cars.

Iron and Industrial Stocks

NEW YORK, June 10, 1914.

The volume of business in stocks was considerably increased the past week and prices were decidedly strengthened by reports that the Interstate Commerce Commission is on the eve of announcing its decision regarding an advance in Eastern freight rates. It is assumed, of course, that the decision will permit some advance if not the entire 5 per cent. requested by the roads. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., pref....	43	Nat. En. & St., com.	10 1/2 - 11
Am. Can., com....	26 5/8 - 29 3/8	Pressed St'l, com. 43	- 44 1/2
Am. Can., pref....	90 1/2 - 93 1/2	Pressed St'l, pref. 102	- 103
Am. Car & Fdry., com.	50 5/8 - 52 3/8	Ry. Spring, com. 29 1/4 - 29 3/4	
Am. Car & Fdry., pref....	117 5/8 - 117 7/8	Republic, com. 23 - 23 1/2	
Am. Loco., com....	30 1/2 - 32 1/2	Republic, pref....	87 - 88 1/2
Am. Steel Fdry., 31 1/4 - 32 1/4		Rumely Co., com....	12
Bald. Loco., com. 46 - 48		Rumely Co., pref....	30
Bald. Loco., pref....	110	U. S. Steel, com. 60 - 62 1/2	
Beth. Steel, com. 41 1/8 - 43 1/2		U. S. Steel, pref. 109 1/2 - 110	
Beth. Steel, pref. 85 - 85 1/2		West'g'h'se Elec. 76 - 78	
Case (J. L.), pref....	87 1/2	Chic. Pneu. Tool. 54 - 54 1/4	
Colorado Fuel....	27 - 27 1/2	Cambria Steel. 48 - 48 1/2	
Deere & Co., pref. 94 1/4 - 94 1/2		Lake Sup. Corp. 16 1/2 - 18 1/2	
General Electric. 147 - 148 1/2		Pa. Steel, pref. 62 1/2 - 63	
Gr. N. Ore Cert. 30 1/2 - 32		Cruc. Steel, com. 16 1/2 - 16 1/4	
Int. Harv., com. 106 3/8 - 108 1/4		Cruc. Steel, pref. 92 1/2 - 93 1/2	
Int. Harv., pref....	118	La Belle Iron, com.	38 - 34 1/2
		La Belle Iron, pref....	117 1/2

Dividends Declared

The Western Electric Company, regular quarterly, 2 per cent., payable June 30.

The International Harvester Company of New Jersey and the International Harvester Corporation, each regular quarterly, 1 1/4 per cent. on the common stocks, payable July 15.

The Continental Can Company, regular quarterly, 1 1/4 per cent. on the preferred stock, payable July 1.

The American Can Company, regular quarterly, 1 1/4 per cent. on the preferred stock, payable July 1.

The American Car & Foundry Company, regular quarterly, 1/2 of 1 per cent. on the common stock and 1 1/4 per cent. on the preferred stock, payable July 1.

The Union Switch & Signal Company, regular quarterly, \$1.50 on the common and preferred stocks, payable July 10.

The Ingersoll-Rand Company, regular semi-annual, 3 per cent. on the preferred stock, payable July 1.

The Westinghouse Air Brake Company, regular quarterly, \$2 a share, payable July 15.

The Bethlehem Steel Corporation, regular quarterly, 1 1/4 per cent. on the preferred stock, payable July 1.

T. H. Speddy & Co., who are among the oldest and best known manufacturers' sales agents in the far West, announce the removal June 1 of their San Francisco sales offices to more commodious quarters in the Wells, Fargo & Co. building, Second and Mission streets. T. H. Speddy is president and treasurer of the company, which was established in 1891 and incorporated in 1904; K. M. Gilham is secretary. H. H. Speddy is manager of the Los Angeles office, located at 504 I. W. Hellman building. Among the manufacturers represented as exclusive sales agents for California, Oregon and Washington are the Cleveland Twist Drill Company, American Fork & Hoe Company and Royal Mfg. Company. They are also district sales managers for the Cambria Steel Company for California and Hawaiian territory.

The first passage through the Gatun locks of the Panama Canal by an ocean vessel was successfully accomplished June 8 by the Panama Railroad steamship *Allianca*, a vessel of 4000 tons. The trip tested the working of the electric towing locomotives to be used in passing ships through the locks. The time required to pass the locks was about an hour and a half each way.

Safety work in steel mills as applied to electrical apparatus is to be discussed at a meeting of the Association of Iron and Steel Electrical Engineers at the Seventh Avenue Hotel, Pittsburgh, Saturday evening, June 13.

A Shipment of Record Size Gate Valves

Probably the largest steel gate valves for superheated steam yet installed in any of the immense power plants of New York City are those recently built by the Nelson Valve Company, Philadelphia, Pa., for the New York Edison Company. These valves will be used on header lines intended for steam of a pressure of 200 lb. and a superheat of 150 deg. These valves are of two types for hand and chain operation, and weigh 3600 and 3900 lb. respectively. Each of the valves measures 9 ft. 1 in. in height from the top of the stem when the valve is open to the bottom of the body.

The hand-operated valve has a large bushing just below the handwheel which can be removed for the attachment of spur gears, if desired. The other valve is fitted with spur and bevel gears and a chain for operation in that way. The latter type of valve will be installed on a vertical pipe line and the extension stem, to which a bevel gear is attached, will be run through the wall for operating from another room. If desired, this valve can also be operated by chain, the chain wheel being attached directly to the valve stem.

Seven valves of the two types were supplied. These were built and shipped in 50 days from the receipt of the order, which is somewhat of a record when the fact that new patterns had to be made throughout is taken into consideration. Steel and Monel metal were used as the coefficients of expansion of these two metals are practically the same.

Southern Aluminum Company

The Southern Aluminum Company, 52 Broadway, New York, which is building a plant at Whitney, N. C., will issue \$7,000,000 6 per cent. bonds, the proceeds to be used in meeting the heavy construction programme now under way. It will be about a year until the company starts operations to any extent. The ultimate annual production has been placed at 50,000,000 lb. of aluminum, although at the start the output will not exceed 25,000,000 lb. a year. The consumption of aluminum in this country last year was about 76,000,000 lb. while imports from Europe totaled 43,000,000 lb.

The Southern Aluminum Company was founded in Paris where its principal officers reside. The American Metal Company represents it in this country and is understood to have an important ownership in the property. Water power capable of developing 100,000 hp. is to be installed. This will necessitate the erection of a huge dam the cost of which is estimated at \$4,000,000.

The steamer *San Francisco* now in port after her maiden voyage, says the New York Commercial, belongs to the Isthmian Steamship Company, Ltd., of London, a subsidiary of the United States Steel Corporation. She was built by the North of Ireland Shipbuilding Company, Ltd., Foyle Shipyard, Londonderry. The *San Francisco* has an extreme length of 417 ft. and a breadth of 52 ft. She has been designed for carrying rails and other heavy steel products from Eastern ports of the United States to the Pacific coast through the Panama Canal. A speed of over 14 knots can be maintained with a full head of steam.

The Senate approved June 2 by a decisive vote an appropriation for the construction of two new battleships equal in power to the most modern war vessels. An amendment providing for the sale of the battleships *Ohio* and *Mississippi* may cause the building of three dreadnaughts to be undertaken next year. An amendment providing for the appointment of a commission to investigate the feasibility of building a Government armor plate plant was also adopted.

The National Association of Waste Material Dealers will hold its regular quarterly meeting at the Hotel Astor, New York, June 16, at 2 p. m. The various divisions of the association will hold their meetings at the same place as follows: Metal division, 2 p. m., Monday, June 15; scrap iron division, 10 a. m., Tuesday, June 16; paper stock division, including dealers in cotton rags and paper stock, 11 a. m., Tuesday, June 16.

Philadelphia Foundrymen's Association

The last meeting of the Philadelphia Foundrymen's Association prior to the usual summer recess was held Wednesday evening, June 3, at the Hotel Walton in that city and was unusually well attended. In submitting his semi-annual report, the treasurer showed a balance of \$1892, with all bills paid. Resolutions were offered on the death of Peter D. Wanner, on May 1, in Reading, Pa. He was one of the early members of the association, representing at that time the Mellert Foundry & Machine Company, Reading, Pa. He served as president of the association from 1896 to 1899 and was prominently identified with the foundry trade until about ten years ago, afterward being engaged in the practice of law.

The paper for the evening's discussion was on "The Manufacture of Small Steel Castings as a Specialty," by C. S. Koch, president of the Fort Pitt Steel Casting Company, McKeesport, Pa. Substantially the same paper was presented at the March meeting of the Pittsburgh Foundrymen's Association and a large part of it was printed in *The Iron Age*, March 19, 1914.

The speaker stated that in his company's practice low carbon steel, 0.10 to 0.15 carbon, enabled them to produce castings with a minimum of hot cracks, although, in the discussion immediately following, other operators of the converter process said they were obtaining like satisfactory results with steel of 0.20 to 0.25 carbon. It was thought by some of the participants in the discussion that some of the differences in results were due to varying molding practice. There was considerable discussion as to the ability to regulate the sulphur content in converter practice. High sulphurs, it was pointed out, usually came from poor cupola practice but 0.045 to 0.050 per cent. could be maintained with comparative regularity.

Mr. Koch advocated a sliding scale of prices for steel castings, dependent on the weight and character of the casting, over the flat price per pound as usually followed in quoting on gray iron castings, and it was his practice to make each casting made produce a share of the profits rather than make the light work carry any loss resulting from low prices for heavy work.

Proposed Oklahoma-Texas Oil-Pipe Line

The special commission appointed by order of the United States Senate to take testimony and investigate the situation in regard to the contemplated construction of a Government oil-pipe line from the producing fields of Oklahoma to Galveston or some other port on the coast of Texas has concluded its hearings. The main purpose of the line will be to provide at all times an abundant supply of crude oil for fuel purposes for the vessels of the United States navy. The plans also include the erection of a large refinery at the Gulf port terminus. The proposed line will be about 500 miles long. At intervals along the route pumping stations will be located. The pipe will be of 8-in. diameter and will have a daily delivery capacity of 20,000 barrels. It is estimated that the project involves an initial expenditure of more than \$5,000,000.

It was the substance of the testimony of independent oil operators that the Government's plan can be made a great success, and that the revenue to be derived from transporting oil from the interior fields to the seaboard will within a few years amount to more than the cost of the line and all its adjuncts. If pipe line is built, distributing stations will be established at Dallas and other points along the route. The fact that the demands of the navy are only 4000 barrels of oil per day would leave a surplus of 16,000 barrels to be disposed of to private consumers. It is stated by experts in the oil-producing business that the Government will be able to transport oil at a cost of not to exceed 10c. per barrel as compared with the present charge of 45c. per barrel that is made by pipe line carriers on oil from Tulsa, Okla., to Beaumont and Port Arthur. It is expected that whatever point is selected for the Gulf terminus of the proposed line will also be made the site of a large naval base. For this reason there is much rivalry between Galveston, Freeport, Port Arthur and Sabine.

A New Ingot Mold Foundry at Josephine, Pa.

The Bollinger-Andrews Construction Company of Pittsburgh, now operating an ingot mold foundry and structural shops at Verona, Pa., closed a contract last week with the Josephine Furnace & Coke Company, an identified interest of Corrigan, McKinney & Co., of Cleveland, which will result in the building of a new foundry at Josephine for the manufacture of ingot molds. It is the intention of the Bollinger-Andrews Construction Company to remove its present foundry from Verona to Josephine, but the structural shops, which have a capacity for fabricating about 200 tons of steel per day, will remain at Verona. After the new plant at Josephine is completed, it is likely some of the present foundry buildings at Verona will be used for enlargements to the structural shops. The Bollinger-Andrews Construction Company has secured 18 acres of ground adjacent to one of the Josephine blast furnaces on which the new plant will be built. Tentative plans call for the erection of a main foundry building 110 x 408 ft., to contain a casting and stripping floor, sand and supply sheds, two cupolas, blacksmith shop and dry sand department. In the main building will be one 30-ton and two 20-ton electric cranes. The sand and supply sheds, charging platforms and the blacksmith shop will be located in a lean-to, 30 ft. wide, extending the entire length of the main building. The core ovens will be contained in another lean-to, 20 ft. wide, running the full length of the other side of the main building.

Molds for using hot metal will be made in a building 70 x 408 ft. There will also be a pattern shop 60 x 96 ft., and a pattern storage building 60 x 120 ft. The machine shop and green sand department will be contained in a building 60 x 216 ft., served by two 20-ton electric cranes. A building 30 x 216 ft. with a 9-ft. bay, will contain the general supply room and cupolas, two core rooms and a sand shed. There will also be a number of smaller buildings. Work on the new plant is expected to start within 60 days. Its capacity in ingot molds will be from 300 to 350 tons per day. The company will also make castings up to 75 tons.

The supply of pig iron will be obtained direct from the Josephine furnace and hot metal will be used, except in the case of consumers who prefer ingot molds made from remelted iron. The Bollinger-Andrews Construction Company has made a contract with Corrigan, McKinney & Co., for a supply of Bessemer iron for 20 years. When the new plant is running full it will likely need from 350 to 400 tons of Bessemer iron per day. Not only is the new location advantageous as regards the supply of metal, as both freight charges and switching charges are eliminated, but also in the fact that to Eastern markets the freight rate from Josephine is \$1 a ton on ingot molds against the present rate of \$2.10 from Pittsburgh, while to the Pittsburgh district it will have a freight rate of 75c. as against 90c. to Pittsburgh from the Shenango valley. The company will erect all the steel buildings itself, and contracts for the electric cranes and other equipment will be placed in a short time. All the buildings will be of steel and concrete construction.

The Bollinger-Andrews Company is now developing a new design of molds for conserving heat, on which several patents have been allowed, and others are expected at an early date. This mold will be designed especially for ingots to be rolled into steel rails. The officers of the company are G. L. Bollinger, president; T. L. Andrews, vice-president; J. N. Carey, secretary, and J. N. Fisher, treasurer.

The Republic Iron & Steel Company offers until June 30 to retire at 105 and interest its remaining outstanding first mortgage and collateral trust bonds dated 1904. These bonds, of which there are only \$949,000 left outstanding, have been called for payment on October 1 at 105, but the company desires to afford its bondholders opportunity of receiving the premium of 5 per cent. earlier. Payment for the bonds will be made at the Bankers Trust Company, New York.

Plant Railroad Case to Be Tested

WASHINGTON, D. C., June 8, 1914.—The decision of the United States Supreme Court in the so-called tap line cases has given a decided impetus to a movement recently set on foot by the American Steel & Wire Company and other subsidiaries of the United States Steel Corporation, to secure a review by the courts of the decision rendered by the Interstate Commerce Commission a few weeks ago in the Industrial Railways case. While there is a clear distinction between the issues raised in the tap line cases and in the Industrial Railways case, nevertheless certain propositions just laid down by the Supreme Court regarding tap lines are broad enough, in the opinion of counsel, to furnish a new and a firm foundation for contentions which were rather unceremoniously brushed aside by the commission in the Industrial Railways case.

When the decision of the commission in the Industrial Railways case was handed down, it appeared in the form of an opinion that certain divisions of rates conceded by the leading railroad systems to so-called plant railroads were illegal, but the commission made no order in the case, contenting itself with the statement that it assumed the carriers would revise their tariffs in accordance with the opinion. Soon after the announcement of the commission's opinion the main carriers filed revised tariffs striking out all terminal concessions in accordance with the views expressed. Subsequently, certain owners of plant railroads in the iron and steel industry sought to secure a rehearing of the case by the commission, but this was denied. Apparently this ended the matter, in view of the fact that the commission had made no order from which a formal appeal could be taken to bring the issue before the courts. Counsel for the manufacturers, however, decided to appeal to the Supreme Court of the District of Columbia for a writ of mandamus to compel the commission to enter an order in the Industrial Railways case in reference to the Newburgh & South Shore Railway Company, with a view to using such order as the basis of an appeal. Justice Anderson thereupon cited the commission to show cause why such writ should not issue. The citation was based on a petition signed by the American Steel & Wire Company, W. H. Snell Company, S. F. K. Street Barrel Company, Euclid Builders' Supply Company, Lowery Bros., Marcelline Feed & Coal Company, Cleveland Railway Company, Gray Lumber Company, Farr Brick Company, and Great Lakes Towing Company. The petitioners declared that if the finding of the commission that the South Shore road is not a common carrier is put into effect they would be entirely deprived of common carrier railroad service and facilities. Their properties, it was asserted, are connected by sidings with the railroad in question and they have no other railroad facilities for reaching the city of Cleveland, Ohio, and other points.

In reply to the citation of the District Supreme Court, the commission has filed an answer and the case has been set for argument on June 11. In its answer the commission denies that the Newburgh & South Shore Railway Company is a common carrier. The only issue before the commission, it is contended, was "whether or not the said company was entitled to be compensated by the connecting line carriers for switching service performed by it," and the report of the commission was a complete decision of that issue. The fact that by reason of the payment of switching charges to the Newburgh & South Shore Railway Company by

the line carriers the American Steel & Wire Company and other petitioners were enabled to ship and receive interstate freight at the rate applicable to Cleveland is admitted by the commission, but such payment is declared to be in violation of the provisions of the act to regulate commerce and the advantages referred to were, therefore, illegally enjoyed. As to the contention of the petitioners that the decision of the commission deprives them of shipping facilities, the commission declares that "the American Steel & Wire Company owns and operates said plant railroad and it, together with the other relators, have the same use of it that they have ever had and may continue to use the same as heretofore unless the American Steel & Wire Company and its plant railroad withdraw the use of the railroad from the public." The answer further admits that the petitioners are now obliged to deliver their traffic to the main line carriers, but declares that in this respect "they are on no different footing than other shippers in the city of Cleveland who are not located directly upon lines of railroad which are not plant facilities."

In conclusion, the commission admits that petitions for rehearing have been overruled, but denies that it "refuses to enter an order in said proceeding." Indications point to a decision by the District Supreme Court under which the commission will make a formal order in this interesting case which may be used as the basis of an appeal that will bring before the courts all the issues involved in the Industrial Railways case.

W. L. C.

In this connection it is interesting to note that the industrial railroads of Ohio won an important victory in a decision handed down a few days ago by the Ohio Public Utilities Commission, which held that industrial lines are common carriers and are entitled to participate in receipts on intrastate shipments. The decision, in fact, reverses the ruling of the Interstate Commerce Commission. The State Commission order restored the tariff schedules effective prior to April 1 when those affecting intrastate shipments were discontinued. At that time the Newburg & South Shore Railroad of the American Steel & Wire Company at Cleveland and the Lake Terminal Railroad of the National Tube Company at Lorain filed petitions with the State Commission asking relief from the Interstate Commerce Commission order, Ohio railroads being defendants in the action. In its decision the commission said: "We find the complainants are entitled to participate in the joint rates. We order and require the defendants to restore and re-publish, effective at once, the joint tariffs that were in effect and canceled by defendants." This decision conforms with rulings on the same subject given by the State commissions of Pennsylvania and New York.

The plant of the Monarch Metal Mfg. Company, Canton, Ohio, will be placed in operation shortly. The building is over 500 ft. long and about 180 ft. wide, half of it being two stories and the remainder one story. The plant is located on the line of the Pennsylvania Railroad near the Republic Stamping & Enameling Company. The company was formerly located in Kansas City, Mo.

C. W. Leavitt & Co., 30 Church street, New York, have been appointed American selling agents for Eisen & Stahlwerk Mark, Wengern-Ruhr, Germany, manufacturer of carbonless metals and alloys.

Non-Babbitted Bronze Bearings

The American Metal Company, Pittsburgh, which recently completed a new plant at Wilkinsburg, Pa., has been conducting a number of tests to determine the efficiency of bronze journal bearings composed of 65 per cent. copper, 30 per cent. lead and 5 per cent. tin, treated in crucibles. They are solid bronze castings requiring no babbitt surface. In a test for the Baltimore & Ohio Railroad, a 22-lb. bearing was placed under the tender of a Pacific type locomotive. After the engine had run 51,000 miles an examination showed that it had worn 1/32 in. and it was said without becoming heated at any time. Other bearings on the tender were rebabbitted six times each, according to the shop superintendent in charge of the locomotive.

For mill purposes the bronze may be hardened. A test of this nature was made at the Soho works of the Jones & Laughlin Steel Company, Pittsburgh, where two 75-lb. brasses were used under the rolling table of an 108-in. plate mill, the minimum weight of which is estimated at 10,000 lb. The superintendent of the mill stated that the two brasses gave continuous service for four weeks, or twice as long as the ordinary phosphorus bronze bearing. On account of the position of the bearings, it was impossible to lubricate them during the test. Graphite in the lead acts as lubricant, it is stated, making the metal practically frictionless and reducing the amount of the lubricant required.

The plant of the American Metal Company is very similar to that of the ordinary brass foundry. Four furnaces of concrete and fire-brick construction have been built at one end of the foundry building, 40 x 90 ft. A chain hoist is used to carry the molten metal, by means of a trolley, to the molding floor at the opposite end of the plant, where the bearings are cast in the usual manner. After the gates have been sawed off the bearings are polished on an abrasive wheel and then machined on lathes.

Displacement of Good Machinery

How good machinery is being ruthlessly discarded for heavier equipment to secure greater economy is shown by the experience of the New York Edison Company, which is displacing great electric generators that have only been in service in its Waterside station No. 2, New York City, about five years. The General Electric Company is installing for that company a very large Curtis generator and has the past week sold two discarded generators (one 25 and one 62½ cycle), direct connected to a Parsons type horizontal 7500-kw. turbine, designed to run at a speed of 750 r.p.m. The steam end is sufficient to drive either generator when carrying 50 per cent. overload. The 25-cycle generator is 3 phase, 7500 kw., 6600 v. The 62½-cycle generator is 3 phase, 7500 kw., 7500 v. The sale included a condenser having 6000 brass tubes and 3 pumps. The approximate weight of the entire apparatus is 600 tons of cast iron and steel, 50,000 lb. of copper wire, 50,000 lb. of brass tubes, and about 20,000 lb. of brass and babbitt bearings. The entire machinery is in good condition for further use, but was sold for about \$12,000, which is practically a scrap price. The purchaser was John Leonard & Co., Inc., 149 Broadway, New York.

Steel Corporation Orders 278,908 Tons Less

The unfilled orders on the books of the United States Steel Corporation on May 31 were 3,998,160 tons, or 278,908 tons less than the amount reported April 30. The figures for May 31 are the smallest since October 31, 1911, when the unfilled orders were 3,694,328 tons; immediately following which came the movement culminating in the total of 7,932,164 tons of unfilled orders on December 31, 1912. Below is given a statement of unfilled tonnage for each month beginning with the high point of December 31, 1912:

May 31, 1914.....	3,998,160	August 31, 1913.....	5,223,468
April 30, 1914.....	4,277,068	July 31, 1913.....	5,393,356
March 31, 1914.....	4,653,825	June 30, 1913.....	5,807,317
February 28, 1914.....	5,026,440	May 31, 1913.....	6,324,322
January 31, 1914.....	4,613,680	April 30, 1913.....	6,978,762
December 31, 1913.....	4,282,108	March 31, 1913.....	7,468,956
November 30, 1913.....	4,396,347	February 28, 1913.....	7,656,714
October 31, 1913.....	4,513,767	January 31, 1913.....	7,827,368
September 30, 1913.....	5,003,785	December 31, 1912.....	7,932,164

Concrete and Steel Bond Tests

"Tests of Bond Between Concrete and Steel," by Duff A. Abrams, is issued as bulletin No. 71 of the engineering experiment station of the University of Illinois. This bulletin furnishes one of the most exhaustive studies extant of the amount and distribution of the bond stress between concrete and steel. The results of tests of about 1500 pull-out specimens and 110 large reinforced concrete beams are given. The tests covered a wide range of ages, mixes, size of bar, length of imbedment, condition of storage, method of applying the load, etc. Both plain and deformed steel bars were used.

Bond resistance may be divided into two principal elements, adhesive resistance and sliding resistance. In all of the tests measurements were made to determine the relation of slip of bar through the concrete to the bond resistance at different stages of the tests. A considerable bond resistance is developed before a measurable slip is produced. It was found that after slipping begins there is a well-defined relation between the amount of slip of bar and the bond resistance for small slips. For plain bars slip begins at about 60 per cent. of the maximum bond resistance; with further slip the bond resistance increases rapidly until a slip of about 0.01 in. is reached which represents the maximum bond resistance. The amount of slip corresponding to a given percentage of the maximum bond resistance is remarkably constant for a wide range of ages, mixes, conditions of storage, etc. Slip of bar begins at a bond stress equal to about one-sixth the compressive strength of cubes made from the same concrete. The maximum bond resistance is equal to about one-fourth the cube compressive strength.

For deformed bars the relation of slip of bar to the bond resistance was not materially different from that of plain bars in the early stages of the test; in the later stages of the test the bond resistance varied widely with the type of bar and was found to depend on the area and slope of the bearing surfaces presented by the projections of the bar.

Twisted square bars were found to be inferior to plain round bars on the basis of bond resistance per unit of area of the surface of the bar.

The usual method of computing the bond stress in a reinforced concrete beam does not take account of all the phenomena of bond action. Slip was first observed in the middle region of the span at loads producing a tensile stress in the reinforcement of about 6000 lb. per sq. in. As the load was increased slip of bar progressed through the outer thirds toward the ends of the beam. In the beams reinforced with plain bars end slip began at about 67 per cent. of the maximum load; for the beams with certain types of deformed bars the value was 51 per cent. In the tests of reinforced concrete beams it was found that a very small amount of end slip represented critical conditions of bond stress.

Copies of this bulletin may be obtained gratis upon application to C. R. Richards, acting director of the engineering experiment station, Urbana, Ill.

The Federal Foundry Company, recently organized to build a new foundry in Indianapolis, Ind., is closely allied to the American Stove Company, some of the same interests being represented in both companies. It will make castings for the plants of the American Stove Company and also do a jobbing business. The plant will include a foundry building, 180 x 400 ft.; a finishing department, 50 x 550 ft.; core room, 40 x 80 ft.; an office, pattern room and pattern safe, 50 x 110 ft., and a power house, 50 x 90 ft. Specifications are now out for complete foundry equipment. All molds will be machine made and the foundry will be provided with about 150 molding machines. The plant will be electrically driven. The construction of the power house is now under way. It is the intention to have the plant ready for operation October 1. It will be under the management of Henry M. Molder, at present manager of the Best Foundry Company, Bedford, Ohio, which is also allied to the American Stove Company. Mr. Molder will divide his time between the two plants.

OBITUARY

John F. Budke

John F. Budke, for years prominent in the manufacture of iron and steel sheets, died at his home in Canonsburg, Pa., June 3, aged 62 years. He was born in Wheeling, W. Va., and was educated in the public schools in that city. In 1885 he became manager of the Budke Mfg. Company, which sold out to the Canonsburg Iron & Steel Company, of which he was made



JOHN F. BUDKE

general manager. In 1900 this company sold its interests to the American Tin Plate Company, and two years later Mr. Budke and his associates organized the Parkersburg Iron & Steel Company, building a sheet mill at Parkersburg, W. Va. For one year he was vice-president and general manager of that company, and in 1904 he organized the Canonsburg Steel & Iron Works, with plant at Canonsburg, and had since been president of that organization. He was also vice-president and a director of the Parkersburg Iron & Steel Company, in addition to having interests in other concerns. He was a pioneer in the Washington County gas fields, the Canonsburg Steel & Iron Works having put down the first gas well in August, 1905, on the mill property. For a quarter of a century Mr. Budke had been active in county and State politics. From 1900 to 1903 he was a member of the State Senate, representing the districts embraced in the counties of Washington, Lawrence and Beaver. He was connected with many public organizations and was active in the Masonic fraternity. For more than 20 years he was a member of the board of managers of the Pennsylvania Training School at Morganza, and was its vice-president at the time of his death. He leaves a widow, three sons and one daughter.

EDWARD G. BRILL, vice-president and treasurer of the J. G. Brill Company, Philadelphia, died June 7, from pneumonia, at his home in Atlantic City, N. J., aged 63 years. He was born in Philadelphia and was the last of the four sons of the late James G. Brill, the founder of the great carbuilding establishment which bears his name.

ELIAS HAIMAN, vice-president Empire Plow Company, Cleveland, Ohio, who was making a foreign tour, died suddenly of heart disease a few days ago in Berlin, Germany.

PERSONAL

J. H. Gray, of the United States Steel Corporation technical staff, associated with W. R. Walker, assistant to the president, sailed recently on a vacation trip to Europe.

B. J. Padshah, Bombay, India, managing director of the Tata Iron & Steel Company, who is now in this country with a view to the extension of his company's American trade, will be accompanied on his return to India by C. P. Perin, New York, consulting engineer of the Tata Company. They will sail from San Francisco and will make a stay in China and Japan.

J. H. Sheadle, who has been secretary of the Cleveland-Cliffs Iron Company since his connection with it, was recently elected vice-president. Mr. Sheadle has long been in charge of the company's ore sales and vessel business.

George R. Heisler has severed his connection with the Charles Dreifus Company, and will hereafter be associated with Morris Weil's Sons, Philadelphia. He will be connected with the steel and iron department and will cover the Eastern territory.

W. L. Jack, treasurer of the Riter-Conley Mfg. Company, Pittsburgh, has resigned.

Herman G. Kiefer, of the metallurgical department of the Timken Roller Bearing Company, Canton, Ohio, was transferred June 1 to the plant of the Timken-Detroit Axle Company, where he will engage in similar work. He has been connected with the Timken companies for the past two and a half years.

W. A. Thomas, who for several years has been commercial engineer in charge of all sales of mining apparatus for the Westinghouse Electric & Mfg. Company, with headquarters at East Pittsburgh, resigned June 1 and has taken up the practice of consulting engineering in Pittsburgh with offices in the Second National Bank Building. He was graduated from Pennsylvania State College in 1898, has had practical training in mining and extensive experience with the large electrical companies. He will specialize on mining.

William Floyd Lee, chief engineer of the C. W. Hunt Company, Inc., West New Brighton, N. Y., at a recent meeting of the board of directors, was also elected vice-president of the company.

Andrew Carnegie has made another endowment gift to the Carnegie Institute of Technology of \$2,000,000, one-half of which is to go to that institution and the other half for general purposes of the Carnegie Institute proper. Including this contribution, Mr. Carnegie has donated to the Institute, and its various departments a total of \$24,000,000.

Julius Kahn, head of the Trussed Concrete Steel Company, has moved his residence from Detroit to Youngstown, Ohio, following the recent removal thither of the general offices of the company.

A. Luckman, managing director of the Usines Carels Freres, Ghent, Belgium, and W. R. Haynie, New York, American representative of the firm, spent last week at Milwaukee inspecting the plant of the Nordberg Mfg. Company. They were the guests of Bruno V. Nordberg, president of the company, during their stay.

H. G. Dalton, of Pickands, Mather & Co., Cleveland, Ohio, who has been traveling in Europe and Egypt the past five months, has sailed for home and will arrive in New York June 13.

Homer J. Weeks, Cleveland, Ohio, who is connected with the safety department of the American Steel & Wire Company, has been appointed by the Ohio State Industrial Commission to take charge of the new factory safety department of Ohio. He has not definitely decided to accept the appointment.

At the initial meeting of the new metallurgical and mining section of the Engineers' Society of Western Pennsylvania, held last week in the society's rooms in

Pittsburgh, John S. Unger, chief of the central research laboratories of the Carnegie Steel Company, was elected chairman of the section.

John H. Wynne has been made manager of the Montreal Locomotive Works, Ltd., Dominion Express Building, Montreal, Que., succeeding Percy Webb, who after years of service with this and the American Locomotive Company, has retired to his farm near Winnipeg. Mr. Wynne still remains with the American Locomotive Company in charge of the Light Locomotive Department, with headquarters at 30 Church street, New York.

William T. Price has been made chief engineer of the oil engine department of the De La Vergne Machine Company, New York.

Richard Khuen, formerly division engineer for the American Bridge Company, Pittsburgh, has been made general manager of the erection department, succeeding Emil Gerber, deceased. L. H. Shoemaker, former engineer, has been made division engineer, succeeding Mr. Khuen.

William A. Bole has been elected vice-president in charge of production and erection at the foundries of the Westinghouse Machine Company, East Pittsburgh and Trafford, Pa. He has been in the continuous employ of the company since August, 1882, and has successively filled the positions of general shop foreman, superintendent, manager of works and consulting engineer and has thus been an active factor in its growth and development for more than 30 years.

Ralph Watson, who went last year to Sacchi, Bengal, as superintendent of open-hearth operations at the Tata Iron & Steel Company's plant, has returned to this country and has resumed his connection with the Homestead steel works of the Carnegie Steel Company.

Pittsburgh and Nearby Districts

The report that the Enterprise Boiler Company, Youngstown, Ohio, will build a new plant at Warren, Ohio, is officially denied. The report arose from the purchase by Miss A. B. Chute, manager of the Enterprise Boiler Company, of a tract of land in Warren, but this was done as a personal investment.

The Duquesne Coal & Coke Company, Pittsburgh, has filed notice at Harrisburg, Pa., of an increase in its capital stock from \$60,000 to \$200,000.

The Hukill-Hunter Company, Pittsburgh, dealer in mill and mine supplies, will increase its capital stock from \$100,000 to \$190,000.

The Skinner Engine Company, Erie, Pa., will increase its capital stock from \$200,000 to \$500,000.

At Youngstown, Ohio, the suit of Davis Brothers against the Carnegie Steel Company, Pittsburgh, Pa., for \$1,000,000 damages was non-suited under a provision of the law that all contracts for \$2500 or more must be in writing. The suit was over a dispute as to the removal of slag, and, as there was no written contract produced, the court granted a non-suit.

The Westinghouse Electric & Mfg. Company, East Pittsburgh, has received a large contract for supplying one of the residence districts of Chicago with new street lighting equipment.

At the monthly meeting of the Engineers' Society of Western Pennsylvania held in Pittsburgh on Tuesday, June 2, George W. Nichols, engineer for the John Eichleay, Jr., Company, Pittsburgh, read a paper on "Principles and Details of Moving Large Structures." At a meeting to be held June 16, Prof. C. L. W. Trinks, Carnegie Institute of Technology, is scheduled to read a paper on "Air in Jet Condensers."

The Crawford Motorcycle Company, Morgantown, W. Va., has been incorporated with \$10,000 capital stock to manufacture and repair motorcycles. Incorporators are, Frank Cox, Jo. L. Keever, E. M. Everly, and others.

The Tygart Valley Lumber Company, Grafton, W. Va., has been incorporated with \$50,000 capital stock to operate lumber mills. Incorporators are, E. M. Doll, O. A. Heffner, C. L. Kimmell, and others.

The plant of the Royal Window Glass Company, Grafton, W. Va., which was destroyed by fire, will be rebuilt and will require new machinery. C. P. Zenor is manager.

The Santo Rubber Company, Oliver Building, Pittsburgh, will build a plant at Niagara Falls, N. Y., to cost about \$60,000. It will comprise a one-story building, 60 x 90 ft., for factory purposes, and a two-story office building, 50 x 50 ft. The company will make automobile tires and other rubber goods.

The Skinner Engine Company, Erie, Pa., builder of high grade automatic engines, has increased its capital from \$200,000 to \$500,000. The company states it will not make any extensions to its plant, and the increase in capital was for the purpose of converting some of its surplus into stock.

The A. Garrison Foundry Company, Pittsburgh, recently turned out a roll for the plate mills of the Otis Steel Company, Cleveland, Ohio, which was 152 in. long and 42 in. in diameter, and weighed 71,000 lb.

Stockholders of the New Castle Steel & Iron Company, New Castle, Pa., offices in the Farmers Bank Building, Pittsburgh, have voted to increase the capital stock from \$350,000 to \$500,000. The additional funds will be used in making extensions to the works, including the installation of facilities for doing electric welding.

The Andrews & Hitchcock Iron Company, Youngstown, Ohio, is building a new blast furnace to replace its No. 2 stack at Hubbard, Ohio. The William B. Pollock Company will do all the plate work, and the Mesta Machine Company is furnishing two blowing engines. Work will not be pushed on the new stack, as the company does not need the iron, and it will not be ready for blast much before January 1. It will have a daily capacity of 450 to 500 tons.

Last week 2500 to 3000 employees of Westinghouse interests at East Pittsburgh went out on a strike, and the number of idle employees has since been increased to perhaps 8000. The companies affected are the Westinghouse Electric & Mfg. Company, Westinghouse Machine Company and Pittsburgh Meter Company—all of whose plants are at East Pittsburgh. The main cause of the trouble was the shortening of working hours from 54 to 45 per week, caused by the business depression. The strikers now make demands which include the elimination of the bonus system; the elimination of all premium systems; the elimination of all piecework systems, and "the arrangement during slack seasons for the alternating lay-off for a short period only and rotation of all employees whose temporary lay-off would not hamper or interfere in the proper operation of the plant."

The wage scale for coal miners in the Pittsburgh district has been adjusted and the miners are returning to work under a contract to be in force for two years. Machine men are to be paid 69c. a ton and pick miners, \$1. Each miner is to be provided with an electric safety lamp. It is estimated these lamps will cost the coal mining companies upward of \$200,000.

Michigan Charcoal Furnaces

The Newberry, Mich., furnace of the Lake Superior Iron & Chemical Company will blow out at the end of June for relining and will be idle about 60 days. The Manistique, Mich., furnace will be out of blast indefinitely. Elk Rapids furnace will be blown in, but will probably go out on the resumption of the furnace at Newberry. The Ashland, Wis., furnace is out of blast. One of the charcoal furnaces at Marquette, Mich., is now out and the furnace at Wells, Mich., is about to be blown out. The Pioneer Iron Company's stack at Gladstone, Mich., has been idle for some time.

The one Bird Coleman furnace at Cornwall, Pa., which the Lackawanna Iron & Steel Company has been operating in the past year, has been blown out and the entire plant is now idle. Some curtailment in operations at the Cornwall iron mines will be made as a consequence.

The Machinery Markets

No general movement toward increased activity in the demand for machinery is seen, yet as was noted a week ago there are signs of improvements here and there, although large sales are absent everywhere. New York continues quiet so far as machine tools are concerned, although there are indications that some lines of general manufacturing are busy. New England is dull and no immediate betterment is expected. Conditions in the machine tool trade show little or no change in Cleveland, and the foundry trade continues dull. Cincinnati is encouraged by the crop prospects, but a disquieting note from that city is that foreign machine toolmakers are preparing to invade this country when business improves. In Detroit there has been a better volume of inquiry, though general conditions are unchanged. Machinery builders in Milwaukee are disappointed over the failure of trade to improve. In St. Louis the sentiment is better, and with the improved feeling has come more inquiry, though it is of a tentative character. Machinery buying in the central South is light. In the Birmingham territory the tone has improved and it is believed that by harvest time activity will be good. In Texas business has been improved by settled weather, though the cotton gin trade has suffered through poor crops. In the Pacific Northwest special lines, such as mining and shingle mill machinery, are in good request. Sales of metal-working equipment are poor in San Francisco, though the business of jobbing machine shops and foundries is gradually increasing.

New York

NEW YORK, June 10, 1914.

The majority of the local machinery men who do business with the railroads are gathered this week at Atlantic City, N. J., where from today until June 17 they will devote themselves to meeting railroad shop master mechanics, superintendents, foremen and others at the exhibition of machine tools, equipment and supplies which is conducted in connection with the conventions of the Master Car Builders' and Master Mechanics' associations. The exhibit promises to be as extensive as in previous years, and in some ways more interesting, inasmuch as some makers of machine tools will display their line for the first time on an occasion of this kind, while others who have exhibited heretofore will show new models of machines. Most of the machinery will be in operation as heretofore. The trade continues to find business quiet, sales being scattered and mostly of small and comparatively inexpensive equipment. That some lines of general manufacturing are active is indicated by the experience of a firm recently established in this city to manufacture screw machine products, which already has obtained more orders than its present equipment can handle. Railroad buying has shown no betterment, but action by the Seaboard Air Line is believed to be near.

The Borough of Brooklyn, New York City, has appropriated \$1,722,600 for the development of a water supply on Long Island. It includes the construction during 1914 of an infiltration system, to cost \$1,300,000, a high-pressure pumping station, to be constructed at Massapequa, to cost \$25,000, and a new pumping station at Mount Prospect station, to cost \$17,600.

R. A. Harkins, borough clerk, Milltown, N. J., will receive bids until 2 p. m., June 15, for furnishing a sewage pumping station, etc.

The Journal and Courier Company, Little Falls, N. Y., has let the contract for a two-story addition to its printing plant.

The August Feine & Sons Company, Buffalo, manufacturer of ornamental iron work, has let the contract for the erection of a machine shop of concrete and steel construction, to be built at Baraga and Abbey streets and the Lackawanna Railroad.

A power house to cost approximately \$100,000 is to be built by the Port Jervis Light & Power Company, Port Jervis, N. Y.

The Buffalo Wire Works, Buffalo, will build an addition to its factory.

The Zenith Wire Company, Jamesville, N. Y., has been incorporated by H. Hoatling, W. A. Battle and H. V. Ellison, Syracuse, N. Y., with a capital stock of \$100,000.

The General Electric Company, Schenectady, N. Y., has let the contract for the construction of a pumping station and sewage system to Brown & Lowe, Schenectady.

McCleary, Wallin & Crouse, Amsterdam, N. Y., have just taken bids on a power house, 50 x 50 ft. and 41 x 123 ft., one-story, brick and steel construction, and will at once take bids on equipment.

The New York State Conservation Commission has approved plans which have been prepared for the construction of a waterworks system at Albion, N. Y. W. B. Dye is president of the commission. The estimated cost is \$100,000.

The O. M. Edwards Company, Syracuse, N. Y., manufacturer of railroad specialties, will soon take bids for a two-story addition to its factory.

The Albany Steam Trap Company, Albany, N. Y., is taking bids for a factory building which it will erect on Railroad avenue.

The village trustees, Bath, N. Y., are having plans prepared for an electric light and power plant for which \$50,000 in bonds have been voted.

New England

BOSTON, MASS., June 9, 1914.

Little can be said in the way of encouragement as to what has transpired in the past week. The machinery trade is still dull, and manufacturers and dealers are not expecting immediate improvement. The political situation seems to engross most business men—at any rate that is the chief topic of conversation. As the campaign shapes itself, improvement should be felt. The fact is that practically every manufacturer recognizes the existing solid basis upon which a little confidence could erect a most flourishing business condition, but the feeling is that of the individual. It requires massing in order to achieve the desired result. While the sum total of announced improvements and enlargements of manufacturing industries this spring is a considerable figure, it is well below the normal. Owners are proceeding very slowly with projected increases. At the same time it is evident that with a substantial revival of business activity, industrial growth will be large and rapid. The latent power of the situation is very great.

The Optical Lens Company, a new corporation, will build a factory at Southbridge, Mass., to have 12,000 sq. ft. of floor space. George H. Du Paul, Southbridge, is president, and C. H. Buckley, Worcester, Mass., treasurer.

Swift & Co., Chicago, have tentative plans for the erection of a cold storage plant at Hartford, Conn., to cost \$100,000.

The Jenckes Spinning Company, Pawtucket, R. I., will build a weave shed 200 x 260 ft., two stories.

James G. and Bert J. Fellows, Manchester, N. H., will erect a three-story factory, 50 x 100 ft., for the manufacture of caskets.

The Howe Scale Company, Rutland, Vt., has begun the construction of a concrete building, 40 x 195 ft.

The Westfield Plate Company, Thompsonville, Ct., is contemplating the purchase of the plant of the Enfield Textile Company, Westfield, Mass.

Philadelphia

PHILADELPHIA, PA., June 8, 1914.

The Pedrick Tool & Machine Company, 3646 North Lawrence street, Philadelphia, Pa., is adding an erecting shop to its present plant. No additional machinery equipment is contemplated.

The Alva Carpet & Rug Company, Oxford & Hedge streets, Philadelphia, is building a three-story factory, 200 x 550 ft. M. Ward Easby, Crozer Building, Philadelphia, is the architect and engineer.

The Lehigh & New England Railroad Company, 437 Chestnut street, Philadelphia, Pa., will erect repair shops at Pen Argyl, Pa. R. H. Wilbur is general manager.

The Waynesteele Corporation, Waynesboro, Pa., has been incorporated with a capital stock of \$250,000 by H. D. Reynolds and others. It has leased the Greencastle plant of the Emerson-Brantingham Company, which is fully equipped. The new company will manufacture a patented mold.

R. B. Wood, E. A. Clark and R. E. Atkinson, Norfolk, Va., are building a foundry at a cost of \$10,000.

G. Wallwork, town clerk, White Sulphur Springs, Va., will receive bids until 8 p.m., June 15, for a sewage disposal plant. The mayor is in charge.

Chicago

CHICAGO, ILL., June 9, 1914.

The American Car & Foundry Company, 2533-37 South Wood street, Chicago, will build a one-story steel addition to its shop, 40 x 60 ft.

The Fussell Tractor Company, Chicago, has incorporated with a capital stock of \$125,000 to manufacture and sell tractors, machines, etc. Incorporators are George Fussell, M. M. Levie, George Gillette, 657 First National Bank Building, Chicago.

The blacksmith and repair shops of the International Car Company at West Forty-second and South Wood streets, Chicago, were completely destroyed by fire with an estimated loss of \$100,000.

The Barrett-Cravens Company, Chicago, has been incorporated with a capital stock of \$5000 by Arthur M. Barrett, John J. Sebald and Albert E. Lucius, 38 South Dearborn street, to manufacture and deal in machinery, appliances, etc.

The Des Moines Bridge & Iron Company, Des Moines, Iowa, has been awarded contract to build and equip a waterworks system for the town of Stanwood, Ill., which is to cost \$8200.

The Moline Foundry Company, Moline, Ill., has increased its capital stock from \$15,000 to \$17,000.

The board of supervisors, Des Moines, Iowa, has plans for the construction of a water system for the county farm, to cost \$17,000, \$6000 of which will be expended this year.

The Dakota Engineering Company, Mitchell, S. D., will receive bids until July 15 for constructing a sewer system and sewage treatment plant for the town of Tripp, S. D.

The Wisconsin Steel Company, Harvester Building, Chicago, will build a steel machine shop at its Hawkins mine, Nashwauk, Minn. The plans call for a model shop to cost between \$25,000 and \$30,000.

The Rural Road Machinery Company, Quincy, Ill., has been incorporated with a capital stock of \$10,000 by A. Akers, Will J. Haintz and John L. Loebbing.

Milwaukee

MILWAUKEE, WIS., June 8, 1914.

Machinery builders are disappointed over the lack of improvement in business which was hoped especially at this time to make possible the increasing of payrolls. As a matter of fact, a few men are being laid off right along in some of the most important establishments. What little business is developing is unimportant compared with previous bookings. There is hardly a bright spot in the situation to give reason for optimism and little is expected in the way of a turn for the better for the next two or three months, at least. A compensating feature is the fine run of business enjoyed by makers of specialty machines, such as concrete mixers and farm power equipment. In these lines outputs are being increased week after week and material is moving as fast as it can be finished.

The A. E. White Machine Works, Eau Claire, Wis., has leased the entire Losby building on Wisconsin and North Dewey streets, part of which it has occupied for several months, and will quadruple its floor space at once. The building will be thoroughly remodeled for machine shop purposes and new equipment purchased. The principal products are saw-sets and swages. A. E. White is president.

The P. F. Murk Foundry Company, Beloit, Wis., is having plans prepared for a 60 x 80 ft. concrete addition, to be erected the last half of the year.

Articles of incorporation have been filed in behalf of the

Bay Iron Works, Bayfield, Wis. The capital stock is \$15,000 and H. C. Weaver, T. A. Bruett and F. S. Blackmarr appear as incorporators.

A concrete block addition, 40 x 60 ft., is being erected by the Wisconsin Farm Implement Company, Beloit, Wis., for general factory purposes. Slater & Marsden are the proprietors.

In preparation for the erection of a new shop building, to cost \$15,000, A. F. Wagner, 516 Market street, Milwaukee, who has been operating a small structural iron shop at that location for several years, has organized the A. F. Wagner Agricultural Iron Works, with capital stock of \$25,000. A. F. Dreis and W. F. Eichfeld are associated with Mr. Wagner. The shop will be 69 x 90 ft., two stories, of brick and steel.

The Prime Steel Company, 674 Kinnickinnic avenue, Milwaukee, Wis., manufacturer of open-hearth and crucible steel castings, is building an addition to its main foundry 100 ft. long. Additional equipment has been contracted for.

The Milwaukee Printers' Roller Company, Milwaukee, is about to award contracts for the erection of a three-story brick and mill construction factory at Greenbush and Virginia streets. Dimensions are 50 x 60 ft. Charles J. Keller is the architect.

The town of Altoona, Wis., will build a waterworks to cost \$12,000.

The Minneapolis, St. Paul & Sault Ste. Marie Railroad is preparing to rebuild the roundhouse and division shops at Portage, Wis., destroyed by fire a month ago. E. T. Stone, Minneapolis, Minn., is the purchasing agent.

The Chicago & Northwestern Railroad Company is preparing to make important improvements to its division headquarters at Kaukauna, Wis., including enlarging the roundhouse, new turntables, boilers and a small list of new equipment. F. Slater, Kaukauna, Wis., is division master mechanic.

The Mount Pleasant Dairy Company, West Allis, Wis., will build a new dairying and pasteurizing plant to cost \$25,000. William R. McKown is president.

The Racine File Company, Racine, Wis., has purchased a site at Dodge and Wisconsin streets for the proposed new factory building, noted in previous issues. Work will begin June 15.

The Turner Mfg. Company, Port Washington, Wis., manufacturer of gasoline engines and power farm equipment, has increased its capital stock from \$100,000 to \$150,000. It has been enlarging its plant and increasing its production during the last six months. It formerly was known as the Western Malleable & Grey Iron Company.

Detroit

DETROIT, MICH., June 8, 1914.

Conditions in the local machinery market are seemingly on the mend; reports of better business are quite general and while no large purchases of tools have been made the volume of business has been better this week than for some time past. Inquiries are steady but show no great increase in number so that the present increase of activity may be only temporary. General manufacturing conditions remain practically unchanged, a fair run of orders are being received by most manufacturers and there is no present prospect of further curtailment of operations. Announcement of extensions to plants are few, the lack of such additions being especially noticeable in Detroit, there being relatively more activity in this line in the upstate cities.

The Detroit Wire Spring Works, Detroit, has broken ground for the erection of a new two-story brick factory building at Marston and Morrow avenues.

The Detroit Box Company, Detroit, has been incorporated with \$15,000 capital stock to manufacture boxes and other containers. Benjamin Braven and David Berger are among the incorporators.

The General Aluminum & Brass Mfg. Company, Detroit, has taken out a building permit covering the erection of a two-story brick and steel factory, to cost \$50,000.

The Detroit Auto Specialty Company, Detroit, has begun the erection of a considerable addition to its plant at 223 Greenwood avenue, to be used for manufacturing purposes.

The Woodward Pump Company, Detroit, has been incorporated with \$3000 capital stock to manufacture automobile pumps. It has established temporary quarters at 223 Third avenue and its products will be manufactured on contract at present. The capital stock will be increased to \$50,000 later, to provide for manufacturing facilities.

The Hunt-Buse Mfg. Company, Newaygo, Mich., has been incorporated with \$50,000 capital stock to manufacture

furniture and has secured a plant. The incorporators are C. A. Hunt and F. W. Buse, Newaygo, and W. E. Tallmade, Grand Rapids.

The Maurer Glove Company, Grand Haven, Mich., will build a factory at Spring Lake, Mich., and remove its business there. Some new electrically driven machinery will be purchased.

The Flint Machine & Novelty Works, Flint, Mich., has been incorporated by George Le Clair, Ira E. Applegate and Alfred Galbraith and will engage in the manufacture of various specialties.

The Walker Candy Company, Muskegon, Mich., has had plans prepared for an addition to its plant. The new building will be 32 x 100 ft., two stories, and will be modernly equipped.

The Brownwall Gas Engine & Pulley Company, Lansing, Mich., is planning to remove its business to Holland, Mich., where a new plant will be erected. The building will be 50 x 150 ft., one story.

The Factory Supplies Company, Lansing, Mich., has increased its capital stock from \$25,000 to \$50,000.

The Alma Standard Foundry & Mfg. Company, Alma, Mich., has begun the erection of an addition to its plant, 34 x 56 ft., one story, to be used as a molding room.

The Auto City Metal Spinning & Mfg. Company, Detroit, has been incorporated with \$5000 to engage in the metal spinning business. Richard J. Purvis, Jacob Hagen and Lawrence Schuler are the incorporators.

Indianapolis

INDIANAPOLIS, IND., June 8, 1914.

The Comet Cyclecar Company, Indianapolis, has been incorporated with \$20,000 capital stock to manufacture cyclecars. The directors are F. P. and L. F. Mertz and W. H. Ogborn.

The Elkhart Computing Scale Company, Elkhart, Ind., has been incorporated with \$10,000 capital stock to manufacture scales. The directors are C. B. Brodrick, J. R. Winer and J. L. Brodrick.

The Veedersburg Paver Company, Veedersburg, Ind., has been incorporated with \$100,000 capital stock to manufacture bricks. The directors are E. F. Otto, A. H. Bauer and J. B. Klem.

The Perkins Valve Company, Elkhart, Ind., has been incorporated with \$50,000 capital stock to manufacture flush valves. The directors are Joseph G. Perkins, F. E. Bortel and R. Turnock.

The McGill Metal Company, Valparaiso, Ind., has been incorporated with \$100,000 capital stock to manufacture metal products. The directors are J. H. McGill and H. W. and L. M. Harrold.

The Graham Glass Company, Evansville, Ind., has increased its capital stock from \$50,000 to \$500,000.

The Maxwell Mfg. Company, Newcastle, Ind., will build an addition to its plant, 60 x 100 ft., and install new mechanical equipment costing about \$120,000. The company manufactures auto parts and repairs automobiles.

Cleveland

CLEVELAND, OHIO, June 8, 1914.

Dealers are devoting considerable attention to two good-sized inquiries recently reported, which are expected to result in the placing of orders within the next week or two. No new inquiries of any size came out during the week and generally conditions in the machine-tool trade show little change. There is a light demand for single tools, mostly in small sizes. This business for the most part is coming from small machine shops. The Otis Steel Company is figuring on an 84-in. boring mill which is expected to about complete the requirements of its new machine shop. One line of equipment that is quite active is contractors' buckets and derricks. In the foundry trade conditions continue dull.

The Auto Products Company, Canton, Ohio, has been organized to manufacture automobile parts and will establish a plant in the building formerly occupied by the Canton-Hughes Pump Company. The company plans to purchase about 50 machine tools. A list is now in the hands of dealers but numerous changes will probably be made in the list as sent out.

The Owens Bottle Machine Company, Toledo, Ohio, which, as previously announced, will buy considerable machinery

equipment, has a list out that includes 12 lathes, four milling machines and four or five other tools.

The Schaefer Wagon Company, 4170 Lorain avenue, Cleveland, has awarded a contract for the erection of a four-story plant addition to be used for blacksmithing and other manufacturing departments.

M. W. Heller, of the Cleveland Brass Mfg. Company, Cleveland, will build a three-story brick and concrete plant, 94 x 155 ft., at Superior avenue and East Twenty-third street, to be occupied by a garment factory. Christian, Swarzenburg & Gaede are the engineers.

The Cleveland Metal Products Company, Cleveland, will enlarge its plant by the erection of a two-story brick and steel addition, 80 x 260 ft. Plans have been prepared by George S. Reider & Co., engineers.

The Cleveland Die, Tool & Engineering Company, Cleveland, has been incorporated with a capital stock of \$10,000 to make dies, tools, jigs, etc. The company has established a plant on Carnegie avenue, near East Fifty-fifth street.

The city of Cleveland, through its commissioner of purchases, will receive bids June 19 for two 300-hp. water-tube boilers and the necessary stokers for the infirmary at Warrensville and for stokers for two 250-hp. boilers for the City Hospital.

The Toledo Steel Tube Company, Toledo, Ohio, has been incorporated with a capital stock of \$100,000 by H. W. McKisson, J. C. McKisson, S. A. Snell, G. A. Freeman and F. H. Ensign.

The Kyle Mfg. Company, Washington Court House, Ohio, is planning to move its foundry to another site and may locate in Lancaster, Ohio.

The Defiance Pressed Steel Company, Defiance, Ohio, has just let a contract for a large addition to its plant.

The Medina Foundry Company, Medina, Ohio, has increased its capital stock from \$75,000 to \$150,000.

Cincinnati

CINCINNATI, OHIO, June 8, 1914.

The excellent crop reports now coming in have undoubtedly had a stimulating effect on all lines of business. As a rule, manufacturers have reaped no tangible benefits, but they are all more hopeful regarding the future. This holds good with the machine-tool builders, as well as with other manufacturers. However, there now appears to be some real ground for apprehension as to competition on machine tools from Europe. A prominent machine-tool manufacturer recently returned from an extensive trip through the East and Canada, and he reports German firms as being very active in securing agencies at different points in this country, ostensibly with the idea in view of being well established locally and ready for business when general conditions improve.

There is quite a demand for storage tanks from the oil-field operators, but most of this business is taken by nearby firms. Electrical equipment is slow, with the exception of the smaller units. However, there is a good demand for electric drilling machines and grinders. The foundries report no improvement in their operations.

The plant of the United States Motor Truck Company, Cincinnati, has been purchased by a company headed by R. C. Stewart, president Stewart Iron Works Company, Covington, Ky. The factory equipment will be moved to a new building recently completed by the Stewart Company, adjoining its iron fence works. Only a limited amount of new equipment will be required.

The proposed plant of the Victor Auto Parts Company, Cincinnati, will be 60 x 158 ft., four-stories, of reinforced concrete construction. Mention of this company's intentions was made some time ago, but labor troubles in the building trades delayed operations. Work will be commenced at once.

The Archibie-Brouse-Parker Company, 808 Elm street, Cincinnati, is a new company formed to conduct an automobile repair shop. H. M. Brouse is one of the principal incorporators. Nothing is known as to machinery requirements.

Architect Martin Fisher, 2156 Central avenue, Cincinnati, has completed plans for a four-story brick addition to the plant of the Union Furniture Company, Batesville, Ind.

The Hauser, Brenner & Fath Company, Cincinnati, has changed its name to the Hauser Standard Tank Company.

Cullen, Adams & Schmid, Cincinnati, have let contract for an ice plant that will be constructed at Jefferson and Nixon streets.

The city of Middletown, Ohio, is considering building a large addition to its waterworks plant. No definite plans have yet been made up.

The Apple Electric Company, Dayton, Ohio, which recently suffered a fire loss of nearly \$100,000, has completed plans for rebuilding its factory. Its warehouse and shipping department were not damaged, and no delay is anticipated in making shipments while the manufacturing department is out of commission.

The city of Dayton, Ohio, is considering the installation of a garbage incinerating plant. Plans have not yet been definitely decided on.

The Hayden-Corbett Chain Company, Columbus, Ohio, has let contract for a small addition to its plant on Lorain avenue. No machinery equipment will be required.

The Board of Control, Columbus, Ohio, at a recent meeting, rejected all bids for the construction of a municipal repair shop, mention of which was recently made. New bids will be advertised for this month.

The addition to the plant of the Springfield Brass Company, Springfield, Ohio, recently mentioned as contemplated, will be 32 x 120 ft., one-story, and of brick construction.

The Chase Colvin Company, South Charleston, Ohio, iron fence manufacturer, intends making an addition to its factory that will be 40 x 50 ft., one-story, of brick and concrete construction.

The plant of the Independent Hominy Company, Portsmouth, Ohio, was destroyed by fire May 31, entailing a loss of about \$50,000. The company has plans for rebuilding, in which event, power plant and other equipment will be required.

The Henry Burkhardt Packing Company, Dayton, Ohio, contemplates the erection of a reinforced concrete building estimated to cost \$100,000. Nothing is known as to equipment details.

St. Louis

ST. LOUIS, Mo., June 8, 1914.

Machine tool dealers report that the past week has shown a little more inquiry, but it has been largely of a tentative character and gives hope that matters will mend as soon as improvement comes in the general business situation. There is now a better feeling, from the sentimental standpoint at least, than there has been in the recent past. No increase is seen in the actual business transacted, nor is there any expectation that there will be now for some few weeks—in other words not until the harvesting and marketing of crops, etc. Second hand tools are showing even less activity than new, but dealers very generally report that collections are prompt and take this as evidence that money is plentiful, but timid.

The Vesper-Buick Company, St. Louis, has been incorporated with a capital stock of \$50,000 by F. W. A. Vesper, Fred Campbell and F. E. A. Brock, and will equip a garage.

The Champion Motor Car Company, St. Louis, has been incorporated with a capital stock of \$50,000 by A. R. Walton, O. A. Peters, F. D. McMahon, and others, to do a motor manufacturing and machinist business, etc.

The National Camera Company, St. Louis, will increase its capital stock from \$50,000 to \$100,000 for the purpose of increasing its manufacturing plant, etc.

The Moloney Electric Company, St. Louis, manufacturer of transformers, will construct and equip an addition to its factory.

George F. Smith, 810 North Main street, St. Louis, reported as in the market for a large quantity of equipment for lime crushing and other machinery, is contractor for the plant at Ruddells, Ark., of the Arkansas Lime Company, and his requirements involve about \$25,000 of equipment for which he is now seeking offers.

A waterworks plant to cost about \$16,000 will be equipped at La Grange, Mo., by C. M. Haines, Whitehall, Ill. J. P. Davis, Windsor, Mo., is the engineer in charge. A single acting triplex pump and 200,000 gal. filter are included.

The Farmers' Fuel Company, Kansas City, Mo., recently incorporated by Virgil Tuggles, W. C. Duvall, and others, with a capital stock of \$62,000, will install equipment for a daily capacity of 400 to 500 tons. John H. Bovard is manager.

The Federal Fruit & Cold Storage Company, of which E. G. Simmons, Macon, Mo., is president, will install a large cold storage and refrigerating plant at New Orleans, La.

The Crescent Lumber Company, Kansas City, Mo., has been incorporated with a capital stock of \$30,000 by H. H. Hutchinson, H. C. Beardsley and M. C. Hutchinson and will build a mill.

The Humphreys Lumber Company, Humphreys, Sullivan County, Mo., has been incorporated with a capital stock of \$25,000 by M. A. Allen, C. H. Jones and E. W. Reid, who will erect a mill.

The Kansas City Fiber Box Company, Kansas City, Mo., has been incorporated with a capital stock of \$50,000 by L. H. Fox, James F. Cleary and A. B. McGee, and will establish a plant.

The Little Rock Compress Company, Little Rock, Ark., has been incorporated with a capital stock of \$150,000 by J. M. Biley and P. F. Groom, Memphis, Tenn., and others. It will build a compress at Argenta, Ark.

The Southern Foundry & Machine Company, Little Rock, Ark., has been incorporated with a capital stock of \$20,000 by H. C. Surratt, Charles C. Burns, and others.

The city of Clarendon, Ark., will equip waterworks and sewer plants, including power plant, pumps, and accessory equipment. Bids will be received until June 24 by John W. Hooper, secretary of the board of improvements.

The Delta Millwork Mfg. Company, Dermott, Ark., has been organized by James F. Delaney, D. B. Gilliam and C. E. Courson. Power plant, dry kilns, planers, moulders, shapers, lathes, mortise machine, resaw circular, boring machine and tenoning machine are wanted.

The Fort Smith Vehicle & Machine Company, Fort Smith, Ark., has been incorporated with a capital stock of \$15,000 to manufacture vehicles and wood-working machinery.

W. H. Alfrey & Co., Hope, Ark., will rebuild their heading mill, reported burned with a loss on equipment of about \$60,000.

The city of Wilburton, Okla., will install a waterworks plant and the preliminary work is under the direction of the mayor, who should be addressed. An electric light plant is also planned.

The W. R. Lantz Carriage & Automobile Company, Muskogee, Okla., has been incorporated with a capital stock of \$25,000 by W. R. and A. E. Lantz and J. O. Humphries and will install a repair plant and garage.

The city of Jet, Okla., has voted the necessary bonds for the equipment of an electric light plant. The mayor is in charge.

Steven Burton, Moorhead, Miss., is now in the market for an ice plant. The tonnage capacity has not been determined.

The city of Alexandria, La., is in the market for a vertical centrifugal pump of 2,000,000 gal. capacity, together with a 60-cycle, three-phase motor. Address the mayor, who has charge.

Joseph Norgress, Maringouin, La., will equip a plant for the manufacture of handles of all types, particularly broom handles, and is in the market for wood-working machinery.

The Acme Automobile Company, 710 Julia street, New Orleans, La., has been incorporated with a capital stock of \$18,000 and will equip an automobile repair shop.

The Orleans Chemical Company, New Orleans, La., has been organized with a capital stock of \$100,000 by Nathan S. Stern, and others, and will remodel and re-equip the former plant of the Standard Guano & Chemical Mfg. Company, adding considerable new equipment, for which it is now in the market.

W. C. Brandt, and others, Kinder, La., will equip a plant for the manufacture of silos, having acquired the mill buildings of the Peavy-Burnes Company, which is to have a monthly capacity of 100 silos.

The Texas Fiber Gin Company, Shreveport, La., of which J. M. Eastham, box 464, is president, has not completed details of its plans for equipment, but some machinery will be required.

The Central South

LOUISVILLE, KY., June 8, 1914.

Several important building jobs which will require a lot of boilers and other equipment have given the appearance of activity to the local market the past week, but machinery men say that trade generally is rather light. Electrical equipment manufacturers are getting a considerable amount of business from concerns which are electrifying their plants, this movement seeming to be as popular as ever. Coal-mining operations in eastern Kentucky are developing in large number, and power equipment manufacturers as well as makers of special mining machinery are profiting from this kind of business.

The plant of the Globe Fertilizer Company, Louisville, was burned last week with a loss of between \$150,000 and \$200,000. It has already announced that it will rebuild. Clarence Braden, of the Federal Chemical Company, Lincoln

Building, Louisville, through which the product of the manufacturing company is sold, should be addressed.

The Moran Flexible Steam Joint Company, Louisville is in the market for a second-hand screw-cutting lathe, 36 in. in diameter, with anywhere from a 12 to 16-ft. bed. Address C. H. Jenkins.

The Bouvier Specialty Company, 801 West Main street, has let a contract for the construction of a brick factory. It will move most of its present equipment to the new plant, but will probably add conveying equipment of some sort.

Vogel Brothers & Co., Louisville, shoe manufacturers, who have been considering the erection of a four-story factory addition, are now getting the plans into definite shape. The equipment will be motor-driven.

Gothart Kapfhammer, 1506 South Shelby street, Louisville, will be in the market for a motor for the operation of special bakery equipment. He is erecting a new plant.

The Grunwald Mfg. Company, Louisville, plans to establish a plant for the manufacture of a patented metal table display stilt. C. E. Merriman, Central Furniture Company, Third and Green streets, Louisville, has details.

The Elkhorn & Shelby Creek Coal Company, Penny, Ky., is in the market for a 150-hp. boiler and engine and 150-kw. generator. It will need other general equipment, including a hoisting engine, drum, etc. W. J. Christopher is manager.

The Leer Register Company, Lexington, Ky., has been incorporated with \$75,000 capital stock, and will take over the Leer Mfg. Company, which has been manufacturing account registers and other office equipment. Operations will be enlarged, and a building with 10,000 sq. ft. additional floor space has been leased. New equipment will be purchased at once. C. E. Leer should be addressed.

The Lexington & Eastern Railroad, Lexington, Ky., is reported to have plans for the establishment of car repair shops at Hazard, Ky. J. P. Harrison, Louisville, is purchasing agent.

The Women's Christian Missionary Board, Indianapolis, is to establish an industrial school for negroes near Hopkinsville, Ky. A trade school will be equipped in connection with the institution.

The Service Auto Livery Company, Hopkinsville, Ky., has been organized for the purpose of operating a garage and automobile repair shop.

The Union Home Construction Company, Lexington, Ky., is being organized and will establish a planing mill, for which wood-working and power equipment will be required. D. J. Crowe and William Huber are interested.

The Price Mantel Company, Knoxville, Ky., has been organized and will take over a wood-working plant which will probably be increased in size and capacity. J. J. Price, E. W. Ogden, and others, are interested.

A motor-driven pump will be installed in Belmont Heights, Nashville, Tenn., by the city commission at an estimated cost of \$2000. Address Commissioner Elliott.

The Tennessee Valley Coal, Iron & Railroad Company, Nashville, Tenn., has begun the construction of a sawmill in Wayne County, Tenn., and plans also to build a wood distillation plant and to develop an iron-ore property there. W. W. Collin is manager.

The Jerome P. Parker-Harris Company, Memphis, Tenn., will build a reinforced concrete garage building, 77 x 130 ft., at an estimated cost of \$35,000. A feature of the building will be the repair shop, for which motors and machine tools will be needed.

R. C. Huston & Co., Exchange Building, Memphis, Tenn., have been appointed engineers for South Fulton, Tenn., which plans the construction of a water system.

Henderson, Tenn., is planning the construction of a water plant at an estimated cost of \$25,000. R. F. Huston & Co., Memphis, Tenn., are the engineers.

Maryville, Tenn., will build a waterworks, tentative plans for which were announced some time ago. The city will spend \$80,000 in the construction of the water and sewerage systems. Plans are being made by R. C. Huston & Co., Memphis, Tenn.

The Dixie Brick & Tile Company, Puryear, Tenn., is reported to be in the market for a 100-hp. return tubular boiler and a 150-hp. automatic engine.

The Holzbog Hame & Singletree Mfg. Company, Chattanooga, Tenn., has leased a building at 618-620 Sidney street, and is now purchasing equipment. Address A. T. Holzbog, the general manager.

An electric light plant, water works and sewage plant will be equipped at once by the city of Fulton, Tenn., at a cost of about \$45,000. R. C. Huston & Co., Memphis, Tenn., are the engineers in charge.

The Union Iron Works, Stahlman Building, Nashville, Tenn., has been organized by J. C. Collins, G. D. Siler, John

G. Cooke, and others, and will equip to manufacture heaters of a new type.

S. M. Joyner, Petros, Tenn., and John H. Hatfield, Harriman, Tenn., will equip a saw mill with a daily capacity of \$150,000 ft.

The Southern Railway, through its Washington office, will expend about \$800,000 at the Buntyn yards near Memphis, Tenn., including mechanical coal-handling plant, repair plant and other equipment. F. S. Wynn, Washington, D. C., is the purchasing agent.

Birmingham

BIRMINGHAM, ALA., June 8, 1914.

The tone of the machinery market has improved. There is a more active inquiry from a variety of enterprises, mostly small, but for all sorts of material and machinery and machine tools. Small factory construction features the Southern States at this time. Gasoline engines are in demand. The general feeling has improved and dealers look for decided improvement by the time the crops commence to move in earnest.

J. T. Brown, N. W. Quillan, and others, Ragland, Ala., will rebuild their cooperage plant recently burned with a loss of \$12,000.

Dudley Chipley, Columbus, Ga., has been selected as engineer of the waterworks system to be built by Phenix City, Ala., at a cost of \$20,000.

C. O. Jaggers and associates, Cullman, Ala., have organized the Cullman Fertilizer Company, capital stock \$60,000, to establish a fertilizer factory.

Harrison Kennedy, W. W. Russell, and others, Tuscaloosa, Ala., have organized the People's Ice & Coal Company, with a capital stock of \$10,000, and will build a 30-ton ice plant.

The Cowkee Lumber Company, Rutherford, Ala., will establish a lumber plant in place of the one recently burned, including planing mill and dry kilns. They will also establish a fertilizer mixing plant.

J. M. Norris & Son, Harrison, Tenn., will establish a plant in Tuscaloosa, Ala., for the manufacture of shuttles for cotton mills.

The Pulaski Gin & Milling Company, Hawkinsville, Ga., will establish a ginnery to cost \$10,000.

The Yellow Pine Variety Works, Valdosta, Ga., has been incorporated with a capital stock of \$25,000. J. C. and J. R. Dasher and others are interested.

The W. G. Ragley Lumber Company, Fulton, La., is building a \$300,000 lumber mill at Ragley, La. It is to have a daily capacity of 125,000 ft.

Texas

AUSTIN, TEXAS, June 6, 1914.

More settled weather has caused a revival of the tool and machinery trade all over the State. Prospects of a poor cotton crop, however, have led to the abandonment of plans for the construction of many cotton gins. A decrease in building activities in all the larger cities of the State is also reported.

The Portland Cement Company, Dallas, which has just been reorganized with a capital stock of \$750,000, will make extensive improvements to its mill, including the installing of additional machinery.

The board of water commissioners, Temple, will install a new pump at the water works.

The Lone Star Gas Company, Ft. Worth, will spend about \$1,000,000, installing an air compressor and making other improvements to its extensive natural gas holdings in the Petrolia field.

Albert A. Browne, Brownsville, and associates, will construct an electric power plant.

The Houston Fruit & Preserving Company, Houston, is being organized with a capital stock of \$200,000 for the purpose of constructing a canning factory. John H. Kirby is interested.

O. P. Shugart and J. A. Cameron, Brownwood, will double the capacity of their mattress factory.

The Martin Wagon Company, Lufkin, will construct a large wagon factory. It has operated a small factory in Lufkin for some time.

The Texas Steel Range Company, Waco, will build a factory for making steel ranges and stoves.

The Sherwin-Williams Paint Company, 691 Canal road, Northwest, Cleveland, Ohio, will establish a branch factory at Dallas, to cost about \$25,000.

The Empire Brick Company, Mexia, will equip a large brick-making plant. S. F. Kirksey is president.

The International Smelting & Refining Company, 42 Broadway, New York City, will erect a large power plant at Miami, Ariz.

The Trinidad Sand, Stone & Gravel Company, Trinity, which has been organized with a capital stock of \$25,000, will install machinery for operating its sand and gravel beds. J. P. McKinnis is interested.

The city of Temple will replace the dam across the Leon River, six miles west of Temple, and in connection with the work will require pumping machinery.

San Francisco

SAN FRANCISCO, CAL., June 2, 1914.

The machine-tool trade is in a condition of almost complete stagnation. The number of shops and foundries which may be considered fairly busy is gradually increasing, but very few are definitely in the market for additional tools, and many are still running on a very limited scale. Mining machinery has been in moderate demand for some time, and the report that many old mines are to re-open gives some encouragement. Road machinery has picked up within the last fortnight, but there is less business in sight than a year ago, while wood-working machinery is just about holding its own. The demand for irrigation equipment is less widely distributed than last year, but a few large orders are coming out. Marine gas engines of local make are in good demand, and considerable marine repair work is under way.

The Cage Engine & Mfg. Company, Mesa, Ariz., has been incorporated, with a capital stock of \$2,500,000, for the purpose of dealing in water craft and marine and dredging machinery, etc.

It is reported that several new tools are to be installed at the Southern Pacific Company's shops, Sparks, Nev. I. O. Rhoades, San Francisco, is general purchasing agent.

The Capitol Milling Company, Los Angeles, has started work on a large addition to its grain elevator and storage plant.

B. V. Garwood, city clerk, South Pasadena, Cal., will receive bids until noon, June 13, for constructing a complete sewer system to cost \$200,000.

Los Angeles County authorities are having plans drawn for a machine shop.

The Pacific Northwest

SEATTLE, WASH., June 2, 1914.

The local dealers report fair business, especially in mining and shingle-mill machinery. Several large orders of fish cannery machinery have been shipped to Alaska in the past two weeks. Collections are fair.

The Pacific Rubber & Tire Mfg. Company, Seattle, has been incorporated for the manufacture of automobile tires and tubes, with a capital stock of \$25,000. B. L. Gates and C. A. Kilbourne, Seattle, and others, are the incorporators.

The power house of Wood & Iverson, Hobart, Wash., was recently destroyed by fire. The loss includes all the company's tools, which were stored in the power house.

The H. T. H. Shingle Company, Stanwood, Wash., has been formed, with E. P. Holgren, N. E. Tipple, C. T. Hegg, the incorporators. Faussett & Smith, Stoke Building, Everett, are the attorneys. It will erect a shingle mill.

The mill of the Robinson Lumber Mfg. Company, Everett, Wash., was recently damaged by fire, including the loss of dock, tramway, and considerable machinery. Repairs will be made at once.

The plant of the Eldred Box Company, Tacoma, Wash., was completely destroyed by fire, with a loss of \$25,000. The plant will be rebuilt.

Carlisle Brothers, Kansas City, will erect a lumber mill northeast of Napavine, Wash., to cost about \$200,000.

The Harney Electric Company, Burns, Ore., was recently incorporated with a capital stock of \$250,000 to acquire holdings filed on the North fork of the Malheur River, where a large power plant will be built.

The city of North Powder, Ore., will receive bids until June 23 for purchase of a bond issue of \$20,000, to be used in construction of waterworks, including pumping machinery, etc. J. E. Sencerbox is city recorder. J. B. and R. E. Koon, Portland, Ore., are the consulting engineers.

J. B. C. Lockwood, consulting engineer for the Port of

Portland, Ore., has been commissioned to draw plans for an electric hydraulic dredge to be used by the Tacoma Dredging Company. The suction pipe will be 24 in. in diameter.

The Alaska Water, Light & Power Company, Valdez, Alaska, has filed amended articles of incorporation, increasing the capital stock from \$100,000 to \$250,000. The fund thus acquired will be used in improvements and extensions to its properties. S. A. Hemple, Valdez, is president.

Hunter Supplee, Elks City, Idaho; Alfred Adams, Atlantic City, N. J., and others, will erect a commercial power plant at Elks City to develop from 700 to 1000 hp.

Eastern Canada

TORONTO, ONT., June 6, 1914.

The Doering Trunk Company, Waterloo, Ont., will make large additions to its plant. It has asked for a loan of \$15,000 for 15 years.

The lumber mill of S. E. Cars & Co., Orillia, Ont., has been totally destroyed by fire. Much valuable machinery was destroyed. The loss is estimated at \$100,000.

The City Council, St. John, N. B., has agreed to lease to the Canada Nail & Wire Company a site at West St. John upon which the company will erect a factory.

The Otterbrook Lumber Company, Ltd., Montreal, has been incorporated with a capital stock of \$45,000 by Harry Ibbetson, A. R. Johnson, L. H. Boyd, and others, to manufacture lumber, etc.

The Canadian Picture Stamp Company, Ltd., Ottawa, Ont., has been incorporated with a capital stock of \$40,000 by Theodore St. Germain, J. E. Fraas, G. H. Wilson, and others, to manufacture printing machinery.

The Union Cement Company, Ltd., Owen Sound, Ont., has been incorporated with a capital stock of \$200,000 by T. L. Dates, A. L. Randall, John McDonald, and others, to manufacture stone, cement, lime, etc.

The Canada Pole & Shaft Company, Ltd., St. Catharines, Ont., has been incorporated with a capital stock of \$400,000 by J. S. Campbell, Vernon Moyer, H. M. Campbell, and others, to manufacture poles, shafts, vehicles, etc.

The Ile Import Company, Ltd., Toronto, has been incorporated with a capital stock of \$40,000 by F. V. Clisde, T. E. McCracken, J. R. Roaf, and others, to manufacture electrical appliances, tools, etc.

The Dominion Motor Car Company, Ltd., Berlin, Ont., has been incorporated with a capital stock of \$40,000 by Henry Nyberg, A. H. Millar, L. K. DeBus, and others, to manufacture automobiles, motors, engines, automobile parts, etc.

The water commissioners, Grimsby, Ont., are making large additions and improvements to the city waterworks plant.

The Stratford Mfg. Company, Stratford, Ont., will erect a woodenware factory, 75 x 152 ft., of brick and stone construction.

The Eco-Thermal Stove Company, Kingsville, Ont., is receiving bids for a factory from plans of J. C. Pennington, architect, Windsor, Ont., estimated to cost \$15,000.

A manufacturing plant is to be erected at Pembroke, Ont., by the Electric Mfg. Company of Canada. The citizens of Pembroke have voted a loan of \$50,000 and a bonus of \$5000 toward the purchase of a site for the purpose.

The Sterling Lumber Company, Ltd., Toronto, has been incorporated with a capital stock of \$40,000 by J. M. Prentiss, D. A. Atkinson, W. A. Taylor and others to manufacture lumber, etc.

The Charles Mueller Company, Ltd., Waterloo, Ont., has been incorporated with a capital stock of \$250,000 by J. C. Mueller, Charles Mueller, Leo Henhoeffer and others to manufacture barrels, etc.

The Vanstone-Reade Mfg. Company, Ltd., Oshawa, Ont., has been incorporated with a capital stock of \$40,000 by J. B. Reade, L. N. Vanstone, F. J. Bailes and others to manufacture hinges, hasps, hooks, etc.

The United Rubber Manufacture & Redeeming Company, Brantford, Ont., will remodel and equip an idle factory.

Western Canada

WINNIPEG, MAN., June 5, 1914.

Local machinery houses report an increase in volume of business. A few more new industries are starting up throughout the West, and contracts for machinery supplies for these are being made. There is also a considerable amount of repairing going on in flour mills, lumber mills, mines and the various other

industries. Trade, however, still lacks the activity of two years ago in this country.

The Farmers' Institute, Bird's Hill, Manitoba, will erect a cold storage plant, with the assistance of the Canadian Pacific Railway.

The Mount McKay Products, Ltd., Ft. William, Ontario, which manufactures pressed and common bricks and other clay products, has recently been reorganized with a capital of \$100,000, and the plant will be enlarged.

The Ogilvie Flour Mills Company, Ltd., Winnipeg, is arranging to erect several grain elevators in the Medicine Hat district, Alta.

The Canadian Stock Food Company, Ltd., has been incorporated in Calgary, Alta., with a capital of \$250,000.

E. W. Backus, Minneapolis, Minn., has arranged with the Ontario government for pulp concessions at Kenora, and will build a 100-ton pulp mill.

The city of Edmonton, Alta., contemplates installing a paving plant at a cost of about \$27,000.

The town council, Vegreville, Alta., has decided to spend about \$25,000 for improvements to the municipal electric lighting plant.

The Levy Electrical Company, Ltd., Winnipeg, Man., has been incorporated with a capital stock of \$40,000 by A. Levy, T. J. Murray, D. A. McCormack, and others, to manufacture electrical appliances, etc.

The Metal Shingle & Siding Company of Manitoba, Winnipeg, Man., has been incorporated with a capital stock of \$100,000 by N. J. Dinnen, H. P. Grundy, F. W. Louthood, and others.

The Winnipeg Oven & Tool Company, Ltd., has been incorporated with a capital stock of \$40,000 by G. W. Jones, L. Holling, G. R. Turtle, and others, to take over the Dominion Oven Company, Winnipeg, and to manufacture tools, etc.

W. J. Milford, care of Winnipeg Paper Company, Winnipeg, Man., will open a branch box factory at Edmonton, Alta.

The Winnipeg, Selkirk & Lake Winnipeg Railway Company will erect a stone and concrete powerhouse at Stony Mountain, Man.

Mayor Brown of Medicine Hat, Alta., after consulting with officials of the Maple Leaf Milling Company, announced that the company will at once commence construction on a 1000-bbl. flour mill and an elevator of 300,000 bu. capacity. The work will be rushed.

It is announced that Prince Rupert, B. C., will spend \$300,000 for the construction of a municipal power plant.

Tenders will be received by the City Commissioners, Saskatoon, Sask., for two 4,000,000-gal. motor-driven centrifugal pumps, with switch panel and starting equipment; one turbine-driven centrifugal boiler feed pump complete, with steam separator, etc.; one 75-kw. motor-generator exciter; a 600-kw. rotary converter and transformers, etc., and three 100-kw. transformers, etc.

The town of Edson, Alta., has sold the necessary debentures and will proceed with the installation of an electric lighting plant and power system, at an estimated cost of \$45,000.

The town of Grenfell, Sask., has been granted permission by the provincial government to raise the sum of \$65,000 for extensions to the electric lighting plant.

The Vancouver Lumber Company, Ltd., Burrard Inlet, B. C., proposes to erect a 12-machine mill at Roche Point, B. C. The existing cedar lumber mill will be renovated.

L. A. Welk and J. J. Nickel, Rosthern, Sask., contemplate building a 1000-bbl. flour mill at Swift Current, Sask. Plans are being drawn.

Government Purchases

WASHINGTON, D. C., June 8, 1914.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until June 23, Schedule 6844, for furnishing nine worm-gearred chain blocks of one-ton capacity, for Brooklyn; Schedule 6843, for furnishing 3 bridge cranes, of 5-ton capacity and 3 motor drive, for Puget Sound; Schedule 6850, for furnishing a pressure blower, etc., for Philadelphia; Schedule 6849, for one grinding machine for Norfolk; until June 30, for furnishing under Schedule 6861, 6 two-inch turbine tube cleaners, for Puget Sound; until July 7, Schedule 6890, for miscellaneous band and circular saws; until July 14, Schedule 6851, for miscellaneous generating sets and spare parts; and schedule 6880, for one 14-in. x 8-ft. lathe, all for Mare Island; Schedule 6881, for three five-ton engine hoists for Brooklyn.

The U. S. Reclamation Service, 605 Federal Building, Los Angeles, Cal., will receive bids until 2 p. m., July 14, for fur-

nishing one vertical alternating current generator for the Salt River project, Ariz.

The light house inspector, Tompkinsville, N. Y., will receive bids until 3 p. m., June 17, for furnishing two oil engines and air compressors.

Bids were received at the Bureau of Supplies and Accounts, Navy Department, Washington, June 2, for furnishing materials and supplies for the navy yards, as follows:

Schedule 6687, Steam Engineering

Class 31, Puget Sound—One bridge crane—Bid 61, \$9525 and \$9075; 90, \$8200; 177, \$8339; 189, \$10,150; 207, \$7265; 216, \$10,095; 286, \$9550 and \$9300; 334, \$10,500.

Alternate—Same, f.o.b. works—Bid 61, \$8275 and \$7825; 189, \$9950; 207, \$6455 and \$5875; 216, \$9945; 319, \$9460; 334, \$11,000.

Class 32, Puget Sound—One wall crane—Bid 61, \$4825 and \$4565; 177, \$4707; 207, \$3840, \$3380, \$3600 and \$3145; 216, \$4295; 286, \$5290 and \$4940; 334, \$4050.

Alternate—Same, f.o.b. works—Bid 61, \$4360 and \$4100; 177, \$4707; 207, \$3040; 207, \$2580, \$2805 and \$2345; 216, \$4225; 319, \$4900; 334, \$4400.

Schedule 6764, Yards and Docks

Class 211, Boston (Charlestown)—Fuel-oil pumping units—Bid 1, \$645; 10, \$646; 11, \$712.50; 30, \$560 and \$465; 33, \$546; 46, \$810; 55, \$696.50 and \$690; 77, \$742; 79, \$725; 86, \$690 and \$702; 92, \$765; 228, \$549; 309, \$755.

Schedule 6765, Yards and Docks

Class 212, Key West—One fire pump, complete, with all accessories—Bid 10, \$1825; 11, \$2450; 46, \$2042, \$2260 and \$2363; 55, \$2359.25 and \$2253; 77, \$2660; 79, \$1900; 86, \$2215; 117, \$1085; 309, \$1335.

Schedule 6766, Ordnance

Class 221, Washington—Two 52-in. boring and turning lathes—Bid 149, \$10,669, \$10,469, \$10,810 and \$10,610; 207, \$11,860 and \$11,560.

Schedule 6767, Steam Engineering

Class 231, Norfolk—Two 16-in. crank shapers—Bid 3, \$338.50; 94, \$320; 96, \$334 and \$328; 120, \$344; 157, \$356, \$424 and \$290; 158, \$320; 177, \$400 and \$315; 196, \$315; 207, \$431, \$331 and \$298; 210, \$340; 236, \$390; 257, \$442; 274, \$372.

Class 232, Norfolk—Two 26-in. sliding-head drills—Bid 3, \$409; 94, \$298; 96, \$239.80; 120, \$290; 157, \$393, \$457 and \$241; 117, \$230; 196, \$240; 207, \$279; 210, \$256 and \$261; 257, \$277.32.

Class 233, Norfolk—Two tool-grinding machines—Bid 94, \$74 and \$92; 96, \$64; 157, \$59.75; 177, \$50; 196, \$49.50; 210, \$51.80; 302, \$85.

Class 234, Norfolk—Two 5-hp. vertical steam engines—Bid 176, \$149; 177, \$345; 255, \$484 and \$554; 256, \$468.

Class 235, Norfolk—Two belt-driven engine lathes—Bid 3, \$908; 36, \$1015; 94, \$724; 96, \$809; 101, \$785; 120, \$960 and \$1025; 149, \$940 and \$1034; 157, \$805, \$830 and \$815; 196, \$739, \$849 and \$780; 207, \$930; 210, \$945; 257, \$1030.92; 274, \$968.50.

Bids were received by the purchasing officer of the Panama Canal, Washington, June 3, under canal circular 853, class 1, for furnishing four derricks complete and four operating hoists complete, as follows:

Bid 4, \$11,688, 70 days; 16, \$7720, 75 days; 27, item 1, \$6100, item 2, \$5640, \$5904, \$6634 and \$6584, shpt. 56 to 70 days; 32, item 1, \$4800, item 2, \$3408 and \$4452, 90 days; 38, \$13,200, 135 days.

The names of the bidders and the numbers under which they appear in the above lists are as follows:

1. Advance Pump & Compressor Company. 3. Alexander & Garsed. 4. American Hoist & Derrick Company. 10. Alberger Pump & Condenser Company. 11. Allis-Chalmers Mfg. Company. 16. Dobbie Foundry & Machine Company. 27. Lidgerwood Mfg. Company. 30. F. A. Branda & Co. 32. Mead-Morrison Mfg. Company. 33. Blackall & Baldwin Company. 36. Bradford Machine Tool Company. 38. National Hoisting Engine Company. 46. Camden Iron Works. 55. A. S. Cameron Steam Pump Works. 61. Cleveland Crane & Engineering Company. 77. D'Olier Centrifugal Pump & Machine Company. 79. De Laval Steam Turbine Company. 86. Earle Gear & Machine Company. 90. Exeter Machine Works. 92. Fairbanks, Morse & Co. 94. Frevert Machinery Company. 96. Fairbanks Company. 101. Fitchburg Machine Works. 117. Gardiner Governor Company. 120. Garvin Machine Company. 149. I. H. Johnson, Jr., Company. 157. Kemp Machinery Company. 158. R. A. Kelly Company. 176. A. H. McCay. 177. Manning, Maxwell & Moore. 189. Morgan Engineering Company. 196. D. Nast Machinery Company. 207. Niles-Bement-Pond Company. 210. Prentiss Tool & Supply Company. 216. Pawling & Harnischfeger Company. 228. Providence Engineering Works. 236. Queen City Machine Tool Company. 255. B. F. Sturtevant Company. 256. Snyder & Raub. 257. Smith-Courtney Company. 274. Springfield Machine Tool Company. 286. Toledo Bridge & Crane Company. 302. Valley City Machine Works. 309. H. R. Worthington. 319. Whiting Foundry Equipment Company. 334. Cyclops Iron Works.

Trade Publications

Chain Grate Stokers.—Babcock & Wilcox Company, 85 Liberty street, New York City. Catalogue. Size, $7\frac{1}{4} \times 10$ in.; pages, 63. Gives a number of illustrations of chain grate stokers and views of installations, together with a discussion of their advantages and a description of them. The results of tests made on boilers equipped for these stokers are given. The installations illustrated include a number of central stations and railroad power plants, as well as boiler rooms of industrial establishments.

Steel Castings.—Tropenay Converter Company, 50 Church street, New York City. Pamphlet. Devoted to the manufacture of steel castings with a brief introduction on what steel is and how it is made. The manufacturing process is described at some length with a number of illustrations showing various stages and the different parts that have been made. Mention is made of the accessories used such as sand grinding and mixing pans and ladle heaters. A number of views of installations and testimonial letters are included.

Measuring Tapes and Rules.—Lufkin Rule Company, Saginaw, Mich. Catalogue No. 9. Illustrates and describes an extensive line of measuring tapes and rules which are made in a number of different markings. One of the special features of the tapes is that the foot marks are repeated in small but easily distinguishable figures in front of each inch. The rules are of all the customary types including straight and folding steel and wooden rules for various purposes.

Bubbling Fountains.—Rundle-Spence Mfg. Company, Milwaukee, Wis. Booklet. Describes briefly a line of bubbling fountains for use in schools, shops and public places. A single page is devoted to each style of fountain, an illustration being given at the top with a brief description of the fountain and the dimensions underneath. In addition to the fountains, taking their supply from the city mains, cooler fountains are illustrated with a diagram showing an arrangement for supplying cool sterilized water, the sterilizer being located on an upper floor.

Roll Castings.—Pittsburgh Iron & Steel Foundries Company, Midland, Pa. Folder. Gives a brief list of some of the performances of the company's Adamite rolls in bar, billet, skelp, rail, shape and seamless tube mills. These periods of service range from the same length of time as chilled rolls up to 18 times the service of 0.60 per cent. carbon steel rolls. In addition to the great wearing qualities a high tensile strength is also claimed.

Manufacturing Lathe.—Porter-Cable Mach. Company, Syracuse, N. Y. Circular. Relates to a manufacturing lathe for handling short pieces of medium diameter. The tool is arranged so that the floor space occupied is approximately one-half of that of the ordinary lathe, but the special feature of the tool is an arrangement of the tailstock which permits it to be set up close to the work when very short pieces are being turned and the carriage is not limited in its movement by the position of the tailstock. A description of the lathe is given, the text being supplemented by several illustrations.

Calendar.—Chambersburg Engineering Company, Chambersburg, Pa. This calendar is of the wall hanger type and contains a pad commencing with June 1. The figures, which are easily read, are printed in a color that contrasts with the background, and the number of days that have elapsed since January 1 are indicated. An illustration of a 10-ton steam drop hammer is included.

Roller Bearings.—American Roller Bearing Company, Farmers Bank Building, Pittsburgh, Pa. Pamphlet. Contains a brief statement of the advantages of using roller bearings, together with a concise account of the construction of the bearing, which consists of four parts, the inner casing, the load carrying rollers, the spacing rollers and the outer casing or container. The application of these bearings to machinery, motor trucks, lineshaft hangers, pulleys, railroad service and trolley wheels is briefly touched upon and illustrations of the bearings in use are given. A table of rated loads and the uses to which roller bearings can be put are included.

Reinforcing Bars and Steel Poles.—Franklin Steel Works, Franklin, Pa. Two pamphlets. The first calls attention to a line of reinforcing bars which are made in round, square and twisted styles for use in concrete construction work. A brief description of the process of manufacture is given together with weights and areas and engravings of the different kinds of the bars and stirrups, etc., that can be furnished with views of structures in which they have been used. The other pamphlet refers to the Tripartite steel pole for all forms of overhead construction. This pole is composed of three pieces of steel U-shaped bars which are bound together by malleable iron clamps. Views of the various parts of the poles and the attachments furnished as well as a number of lines that have been built are included together with a partial list of users.

Judicial Decisions

ABSTRACTED BY A. L. H. STREET

CONTRIBUTORY NEGLIGENCE OF STRUCTURAL IRON-WORKER.—A structural ironworker cannot recover for injury through being struck by a girder which was being hoisted, if he was warned of the girder's approach and failed to seek a safe place. (Pennsylvania Supreme Court, Reese vs. Jones & Laughlin Steel Company, 90 Atlantic Reporter 63.)

WHEN ORDER FORMS BINDING CONTRACT.—Although, ordinarily, an order for goods is to be deemed as a mere offer to buy, subject to acceptance by the person to whom it is made, an order will constitute a binding contract if it is given in response to a previous offer to sell on the terms stated in the order. (Massachusetts Supreme Judicial Court, Burroughs Adding Machine Company vs. Cemetery of Mount Auburn, 104 Northeastern Reporter 744.)

RIGHT TO SWITCHING PRIVILEGES.—Where a railroad company agreed to furnish switching facilities for furnaces located on certain land, without regard to who operates the furnaces, one who subsequently took over and operated one of the furnaces is entitled to enforce the contract on the theory that it was made for the benefit of the premises. (New York Court of Appeals, Baird vs. Erie Railroad Company, 104 Northeastern Reporter 614.)

RAILROAD COMPANY'S DUTY TO CONTINUE SWITCHING SERVICE.—The mere fact that a shipper disputes a railroad company's claim for demurrage charges does not warrant the company in refusing to continue switching service which has been afforded him on a private switch track, if he is solvent and good for any claim which the company may establish against him. Suit will lie to enjoin the railroad company from discontinuing the service under such circumstances. (Tennessee Supreme Court, Dunlap Lumber Company vs. Nashville, Chattanooga & St. Louis Railway Company, 165 Southwestern Reporter 224.)

DISCRIMINATION CONCERNING FREIGHT CHARGES.—It is not unlawful discrimination for a railroad company to extend credit to one shipper on account of freight charges, and to require another to make prepayment in cash; and no liability is incurred by a railroad company for refusing to accept a check in payment. (Texas Court of Civil Appeals, Eagle Pass Lumber Company vs. Galveston, Harrisburg & San Antonio Railway Company, 164 Southwestern Reporter 402.)

EFFECT OF MASSACHUSETTS COMPENSATION ACT.—The Massachusetts compensation act does not entitle an employee to an allowance for injury received in the course of his employment through the negligence of an outsider (as where the driver of a truck is struck by a street car), if it appears that the employee has made a settlement with the person legally responsible for the accident. But such settlement does not preclude the employee's widow from recovering death benefits under the act, on his death resulting from the accident. (Massachusetts Supreme Judicial Court, in re Cripp, 104 Northeastern Reporter 565.)

DUTY TO WARN WORKMAN—WHEN DEATH IS "INSTANTANEOUS."—In shifting an employee from one kind of work to another in which he is inexperienced, an employer is bound to warn him against dangers which are not apparent. A statute giving a right of action for "instantaneous" death caused by negligence of an employer extends to a case where a workman remained alive but unconscious for 15 minutes after being injured. (Michigan Supreme Court, Lobenstein vs. Whitehead & Kales Iron Works, 146 Northwestern Reporter 293.)

VALIDITY OF AGREEMENT FOR PAYMENT TO SHIPPER.—An agreement by a railroad company to pay a shipper 20 cents per ton for "spotting" cars on his tracks in his own yards is invalid under the Interstate Commerce act, as amounting to a contract for an unlawful rebate. This charge cannot be sustained as a terminal charge, if it has never been published as such as required by the provisions of the act. (New York Supreme Court, New York Central Railroad Company vs. General Electric Company, 146 New York Supplement 322.)

